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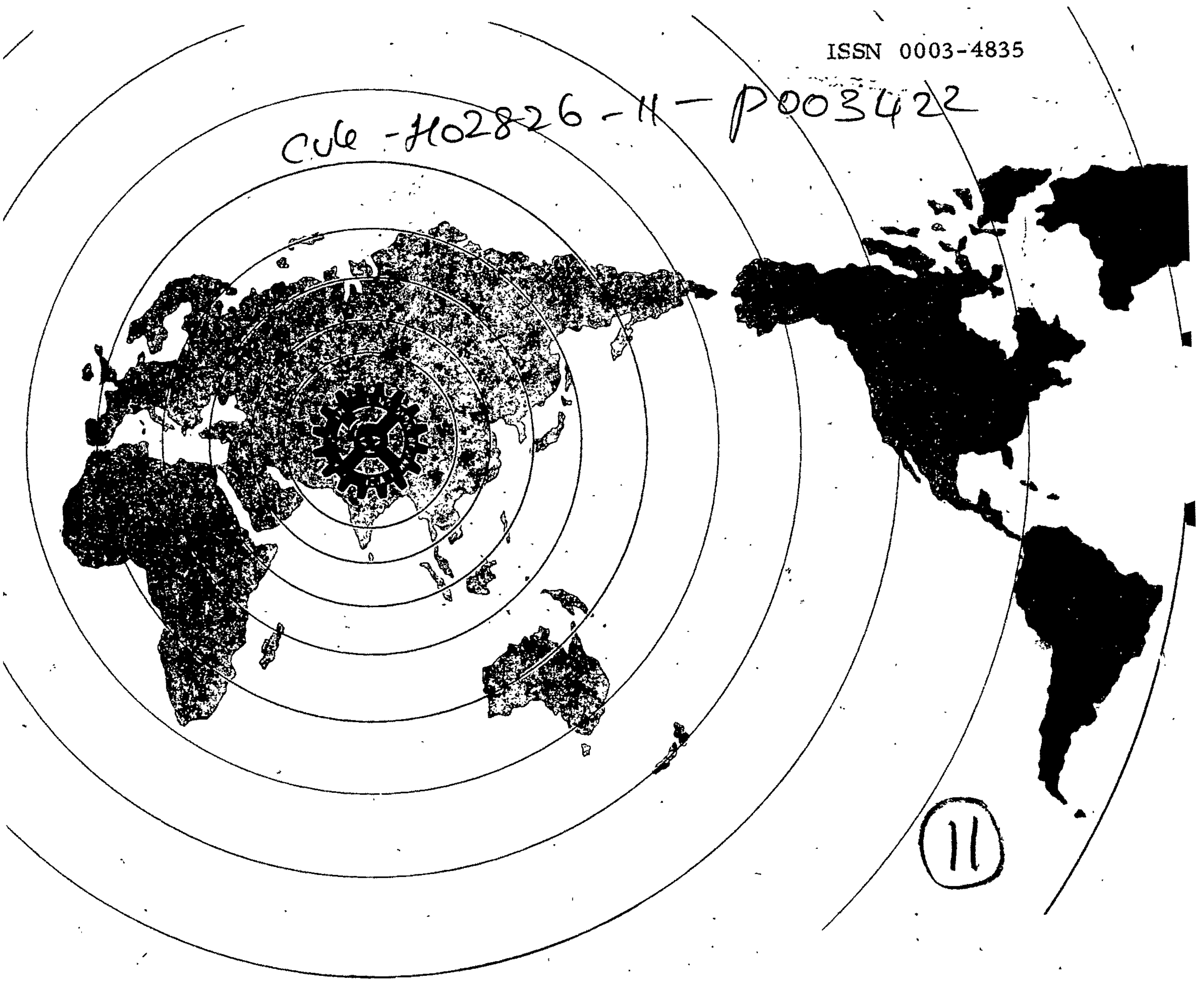

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TRAINING FOR INDUSTRIAL INFORMATION

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Stresses the role of information in industrial development. Describes SENDOC's role in dissemination of information to industrial development organisations. Points out the desirability of having information cells at the point of contact with entrepreneurs. Explains the need for a shorter duration technique oriented training programme for the information personnel at the developmental organisations. Examines in detail the contents and relevance of the training programme 'Information Storage and Retrieval Systems' organised by SENDOC for national and international participants.

NEED FOR INFORMATION

Information plays an important role in the economic and social development of a country. Information is required at every stage of industrial development. Planning and policy formulation at the macro level, and at micro level, from the selection of an industry to all the steps following it for the establishment of the industrial enterprise and running it, needs information.

Information is necessary for the definition of policies and objectives of industrial developments. It is also used by government and other agencies actively engaged in the promotion and development of industry. The industrialists or industrial enterprises, on the other hand, require information at two distinct stages. The first stage is that of pre-investment information, that is, information which will determine an entrepreneur's decision to invest or not to invest. The second stage is that of current operational information, that is, information in support of the day-to-day decision making necessary for the proper functioning of the enterprise.

TYPES OF INDUSTRIAL INFORMATION

The types of industrial information vary from a very simple piece of information as the address of a well established supplier of machinery and equipment to information on such complex problems as market potential, export documentation, alternate technologies available, or the latest data on capacity, production and demand for a particular product. Industrial information involves both macro-economic and micro-economic considerations including technological factors. It may be pointed out here that information for industrialization or industrial information is quite distinct from information for industry, which in turn is much wider than R&D information for industry with which it is very often mistakenly considered synonymous.

Based on an analysis of the various categories of industrial information uses and the different information needs or types of decision which require data support, it was suggested by the participants of the 'Seminar on Industrial Information for the French-speaking countries of the ECA Region' (1) that industrial information should cover – more or less completely – the following areas:

(1) Macro-economics and Social Environment

- Economic policy;
- Economic and social infrastructure: public services, energy, transport, manpower, education, training;
- Economic geography: climate, natural resources;
- Human geography: population distribution, growth, skill;
- Economic development: economic situation, sectors.

(2) Micro-economics (economy of enterprises) and Technical Environment.

- Management: accounting, organisational, technical;
- Cost analysis, production cost;
- Financial problems: Capital, bank loans, financing;
- Production organisation: productivity, rationalisation, maintenance;
- Sales promotion, marketing.

(3) Techno-economic and Economic Environment.

- World, regional and natural production;

- International and domestic commerce: export, import;
- Market, consumption: supply and demand, customer;
- Industrial organisation: sub-contracting, ancillaries.

(4) Regulatory Environment.

- Industrial licensing policy, monopoly regulations;
- Industrial law: company law, tax law, tariff;
- Labour law: labour legislation, union law;
- Industrialization policy: promotional measures, incentives, rebates, collaboration, export promotion, import regulation;
- Exchange regulations.

(5) Technological Environment

- Research and development: new products and processes, patents;
- Technology transfer, technology import, appropriate technology;
- Machinery and equipment: manufacturers and suppliers.

The list, which is by no means exhaustive, is enumerative of the wide range of industrial information. The exact extent of industrial information coverage in a particular country depends on the kinds of users and their needs. As the industrialisation process moves according to plan through its different stages, there are corresponding changes in the scope and the kind of information required.

INDUSTRIAL INFORMATION CENTRES IN INDIA

The tempo and success of information activity is determined by the degree of intensity and sophistication of the industrial and social environment. Before independence, India had hardly any industiral activity worth the name. The only big industry worth mentioning is the Tata Iron & Steel Company, who have a full fledged information department to cater to their information needs.

After independence a number of big industries were set up in India. Since most of the private industries set up had foreign collaboration arrangement, very few of them felt the need for a fully equipped information centre. On the other hand some public sector units, which have R&D departments attached to them have well equipped information centres. Special mention may be made of the information units attached to the Hindustan Antibiotics, Hindustan Machine Tools, and Fertiliser Corporation of India. With the end of collaboration period, the industrial information scene has changed considerably in recent years and more and more industrial concerns are setting up viable information cells.

The need for an industrial information centre for small industry was felt when the Government launched a systematic and concerted programme for the development of small scale industry. This is because, unlike the large industries, the small units are not in a position to maintain their own information centres. Although a number of organisations - like the Directorate of Industries of various States, or the Central Government's Small Industry Development Organisations (SIDO) and its Small Industry Service Institutes and Extension Centres have been catering to the information needs of the small scale sector on an ad-hoc basis, none of them have a regular set up for the systematic collection and dissemination of information. The establishment of the Small Enterprises National Documentation Centre (SENDOC) at the SIET Institute, Hyderabad in 1971 fulfilled this long felt need.

SMALL ENTERPRISES NATIONAL DOCUMENTATION CENTRE

SENDOC is envisaged as a clearing house of information for both small industry entrepreneurs as well as extension agents. The salient features of SENDOC in the five years of its existence have been the building up of an infrastructure of selective resources, competent personnel, and adequate reprographic facilities. Besides offering anticipatory and responsive documentation services, SENDOC has been organizing seminars in the field of industrial information and running training programmes— both national and international— under the title "Information Storage and Retrieval System".

USERS OF SENDOC SERVICES

Before going into the logic or rationale of SENDOC running training programmes in the information field, it may be worthwhile to analyse the clients of SENDOC. Various types of users of SENDOC services could be grouped into the following categories:

1. Individual entrepreneurs;
2. Industrial enterprises;
3. Government departments, like Small Industry Service Institute, Directorates of Industries;
4. Semi-governmental and other institutions like Industrial Development Corporations, State Industrial and Technical Consultancy Organisations (like BITCO, KITCO, etc.);
5. Financial Institutions, like Banks, IDBI, State Financial Corporations;

6. Research and development organisations;
7. Other national and international organisations.

Since the exploitation of the wealth of available knowledge and know-how is of fundamental importance to the process of industrialisation, governments in developing countries are called upon to assume responsibility for the establishment and operation of effective local information services. Although, a number of institutions exist in India who are directly or indirectly engaged in the promotion and development of industry, specially small scale industry, unfortunately most of them suffer from the lack of an adequate information set up.

The first concrete step towards providing systematic information service to the small scale sector was taken with the establishment of SENDOC at the SIET Institute in 1971. But it was soon realised that direct contact with the entrepreneurs is more effective in the transfer of information. Hence the necessity for an information cell at each developmental agency, was felt. The cell need not have an elaborate set up. It can utilize the processed information from SENDOC and also organise the information generated and collected within the organisation. But first the awareness had to be created for the need of information. SENDOC began this awareness programme by organizing a series of seminars — Information for Industry (1972), Information Storage and Retrieval System (1973), Communications for Industry (1974), Computer Based Information Systems (1975), and 'Information for Investment and Development Counselling' (1976). These seminars were attended by representatives from various developmental organizations, besides participants from research and academic institutions. This bringing together of experts from different walks of life has brought forth a new kind of awareness. The information experts from research and academic institutions have a better appreciation of the information needs of the developmental organisations, and the specialists from the developmental organisation now better realise the need for information.

NEED FOR INFORMATION CELLS AT DEVELOPMENTAL CENTRES

In this connection it is pertinent to quote from the 'Report of the Committee to Review the Organisations concerned with the Development of Small Scale Industries, February-June 1975' (Chairman - P.C. Nayak).

"While policy and programme contents for the development of small scale industries are broadly similar in different states, there is a marked difference in the progress and the pace of development achieved in different states ... we find that in some states the dissemination of information about various schemes of assistance available to the small scale sector is very poor. Even some of the personnel of the Industries Directorate at regional and district levels are not aware of the numerous facilities given recently by the Government of India for import assistance to small scale industries. We therefore, recommend that there should be a separate Information Cell in the Directorate of Industries at its Headquarters ... The officer-in-charge of this Cell, at least in the larger states, should be a Class I Officer of the rank of a Deputy Director of Industries. He would need training in his work. We would strongly recommend that the Small Industry Extension Training Institute should organise a training course for such information officers"... (Chapter II, para 2.7).

A number of industrial development centres set up in early seventies soon realised that for more effective discharge of their duties they need to have an information cell within their organisations. Moreover, great deal of valuable information was locked up in their official files unavailable to anybody. Very often, the same information had to be obtained from outside a number of times, since the information was not properly stored. This resulted in unnecessary delay and duplication of efforts.

Of late rudimentary information cells have been set up with some technical personnel of the department in charge of the information cell. These people, knowledgeable as they are, soon found themselves unable to cope up with their new responsibilities without the background of training in information handling.

INFORMATION TRAINING PROGRAMME AT SENDOC

The first national training programme in the field of 'Information Storage and Retrieval Systems was offered by SENDOC during 12-23 August, 1974. There was initial doubt about the acceptance of this programme. Though we felt that there is a need for such a programme, we were not sure whether the client is ready. Although we were sure that the curriculum should not follow the conventional documentation course, we were not sure about the exact inputs required and their relative weightage. Another problem was the duration of the programme. We knew that the clientele we were aiming at could not be spared by their organisations for the available documentation courses which run for one year or more. Moreover, their nature of duties and also the fact, that in many cases, they are holding the information portfolio as a transient phase in their career, precluded the investment by their parent organisation in a long and detailed course.

This problem of the duration of short courses for specialists has been discussed by Schur and Saunders [2]. "There is obviously a limit to the amount of time for which an employer will be prepared to release an established member of his staff, particularly if he is in a senior position, and this sets a practical limitation to the length of short courses. Our enquiries suggest that in the industrial sector three weeks is the maximum period of release that would be acceptable to most employers, and individuals would be unlikely to obtain such release at very frequent intervals. A similar enquiry in the United States showed two to three weeks as the preferred period..... Experience in this country and the United States has shown that really intensive courses of quite short duration can cover a great deal of ground and clear the way for further study by the student in his own time. Prof. R.M. Hayes [3] of the University of California, Los Angeles, has described a two-week course of Information Retrieval and Storage, made up of 40 hours' lecture time and 40 hours study and participation by the student, which covers in a broad way material which he considers could occupy three - or four - year graduate course".

The first course offered by SENDOC was a two-week one. One factor that weighed for a short duration course is the fee structure of the SIET Training Courses, which is Rs.500/- per week (Rs.300/- for the government and non-profit making institutions). We were not sure how many institutions would be prepared to invest this amount on their information personnel. But the response to the very first course was quite encouraging - 14 participants attended this programme and it was decided to continue with this training course. Since 1975 courses are being offered to participants from the developing countries.

OBJECTIVES OF THE TRAINING PROGRAMME

In framing the objectives of the training programme the following factors had to be taken into account:

1. The different levels for which training is required, viz., the operational, supervisory and managerial levels;
2. The variety of organisations requiring to train people in information handling;
3. The fact that the course is a short one, some experience in the information field is a precondition.

It is theoretically possible to have different courses for the different levels. In practice, however, it has been found that every course tends to have participants at all the three levels. As a result the objectives for the course had to be framed in broad terms.

A number of organisations such as technical consulting agencies, departments of industries, development corporations, R&D organisations, large industries and financial agencies are represented in the SENDOC training programmes (Table I). While there are some common features in the information system requirements of these organisations, there are also the specific requirements of individual organisations (e.g., Financial Corporations who emphasize data-based systems rather than document based systems). The course should therefore be flexible enough to cater to varying needs.

A third important factor is that the participants come to the SENDOC courses with many years of experience. The chief strength of such a group of participants is that they possess a good understanding of the needs of their organisations, and are mature enough to determine priorities, methods and services that would best meet their organisational needs. Most of these participants will be called upon to improve the operational aspects of an existing system or to device small systems. The primary emphasis in the course therefore has to be operation and secondarily on design and development. This view has also been expressed by Schur [4] in considering training programmes for information specialists in the OECD countries.

Taking into account the above factors it was decided to frame the objectives of the course in broad terms retaining enough flexibility in course content and methodology to change the emphasis to suit a particular level, or kind of organisation when that was called for. Stated formally, therefore, the objectives of the training programme may be said to be "to help each participant identify the information sources, indexing methods, kind of information files, services and organisational pattern that would best meet stated requirements of his organisation vis-a-vis his own role in the information set up of his organisation".

The above formulation of the objectives of the course has been the result of experience of conducting four national and two international programmes, and after looking critically at participants' evaluation of the course. To begin with, the course started off by trying to provide an overview of the theoretical basis of information storage and retrieval systems and the tools and techniques of information organisation. Not much effort was spent in the beginning to relate course content to actual needs of participants and their organisations. This imbalance we have tried to correct by a proper mix of lecture sessions, assignments and discussions suited to a particular batch of participants.

METHODOLOGY

The presentation of concepts through lectures is considered as only one of the components of the course. Dovetailed into the lecture sessions are a number of individual and group assignments, interpersonal and group discussions, and observation of SENDOC's activities and tours to industrial information centres. Participant time spent in lecture sessions, assignments, and group discussions in each of the core areas of course content is given in Table II.

Assignment Work: The assignment work is planned to give the participants a feel of real-life situations as well as to enable them to take back samples of products that they have developed during the course (e.g., index cards that they have used for a data storage and retrieval system, a list of reference works, uniterm index for a special collection). A set of assignments in the following areas has been developed and is administered selectively (i.e., all assignments are not necessarily done by all participants).

1. Use of sources of industrial information

1.1 Assignment on general and special reference tools.

1.2 Assignment on answering specific industrial information queries (See, Appendix I).

2. Classification, Indexing, and Abstracting

2.1 A group assignment on the UDC: The group is given check list of items against which they study the UDC and present a report to the entire group. This is followed by discussion and consideration of the use of UDC in specific practical cases. The faculty provides to the participants, background reading material for use in the assignment.

2.2 Individual assignment on the use of Trade and Industrial Classifications (e.g., Revised Indian Trade Classification) for organising industrial data.

2.3 Individual assignment on the use of thesauri for post coordinate indexing:

A select bibliography with abstracts is provided to each participant as also a thesaurus which they are to use for indexing. Uniterm index cards are used for indexing. Following the indexing of the references, a set of questions based on the bibliography indexed is posed. Participants are required again to use the thesaurus to formulate search queries to retrieve document numbers answering the queries. The whole work is then subjected to a group discussion where retrieval failures and their causes are discussed.

This assignment is spread over a period of eight days followed by a discussion for two hours. One measure of the learning imparted by the assignment is that many of the participants have requested a repeat of this assignment (Appendix II).

2.4 Individual assignment on abstracting:

A document of a general nature (not highly technical) is given to all participants who are expected to prepare three types of abstracts, viz., annotative, indicative and informative. The prepared abstracts are discussed in the class keeping in mind the desirable characteristics of abstracts.

Those who are keen on doing more assignments on abstracting are allowed to choose articles from their subject fields and prepare abstracts. Abstracts thus prepared are discussed individually.

2.5 Group assignment on Subject Headings lists and their use:

The method followed is similar to the one described for the assignment on UDC.

2.6 Special assignments oriented to the organisation of trade catalogues and report literature.

Group discussions: The aims of the group discussions in general are to:

1. Clarify important concepts discussed in the lecture sessions;

2. Find the applicability of tools and techniques in participants' organisations; and

3. Find possible solutions to problems that are currently being faced by participants.

Each assignment is followed by a group discussion. In addition, group discussions on topics such as indexing, current awareness service and data storage systems are organised. In each of these brief is circulated in advance along with reading material. Participants are encouraged to lead the discussion on these topics with the faculty intervening with questions and issues to stimulate and guide discussion.

The discussion on data storage systems is organised as a panel discussion. The panelists are drawn, one each, from research laboratories, industries departments and large industry. The panelists describe how they have organised data storage in their own organisations, the sources of their data and other processing aspects. Participants and faculty interact with the panelists. The panel's moderator tries to highlight the advantages of methods followed with suggestions to participants for their own organisations.

Visits to Industrial Information Units: One of the chief strengths of the course is that participants can observe from inside the activities of SENDOC. Participants are exposed to the acquisition, processing and servicing operations at SENDOC. Such exposure is again done on a selective basis and depends upon the specific needs of a participant, his level and the kind of job he will be required to perform in his organisation. As an instance, technically qualified participants seconded to information work are made to use literature sources to answer technical enquiries. Documentation personnel are shown the indexing, abstracting, information file creation and current awareness bulletin production routines, while officers from the industrial development and financial agencies are encouraged to identify useful reference sources, feasibility studies, industrial profiles, trade catalogue collections, data storage and retrieval methods. Such exposure often results in interpersonal discussions between participant and faculty where issues specific to an organisation are discussed leading to suggestions of possible methods that could be adopted in an organisation.

It must be emphasised that observation and participation in SENDOC's activities is possible firstly because the course is fully residential, and, secondly because the time table for the course is designed to provide adequate time for practical observation at SENDOC. Lecture sessions are held only in the forenoon leaving the afternoons free for observation, assignments and discussions.

Visits to industrial libraries, documentation units of research laboratories and the information cell in the Industries Department at Hyderabad form part of the course. It may be emphasized here that this practical demonstration is the sine qua non for a short duration training programme.

Course Content

The conceptual content of the course may be divided into the following areas:

1. Scientific, technical and industrial information sources and their use:

1.1 General and special reference works and their use.

1.2 Industrial data system of the country. Organisations responsible for the generation of industrial data.

1.3 Indexing and abstracting periodicals and their use.

2. The theoretical basis of information organisation:

2.1 The need to develop information files and the basic steps in their development.

2.2 Concepts and problems in subject indexing. Desirable characteristics of information files and their implications for subject indexing.

3. The practical tools and techniques of information organisation:

3.1 Vocabulary control, its need and purpose.

3.2 The use of UDC in organising special library collections.

3.3 The use of trade and industrial classifications for data storage and retrieval systems.

3.4 Natural language based indexing with emphasis on using thesauri for indexing.

3.5 Abstracting techniques.

4. Storage media and information file organisation:

4.1 Pre-coordinate and post-coordinate systems of file organisation.

4.2 Manually and mechanically manipulated media and their use in information file building.

5. Information services:

5.1 Anticipatory dissemination services.

5.2 Responsive services: technical enquiries and literature searching.

5.3 Selective dissemination services.

The above areas may be termed as the core of the course. Concept sessions in the following areas are also presented more to present a rounded picture rather than as inputs having a direct application:

1. Computers and their use in information systems.
2. The concept of data banks.
3. Management Information Systems.
4. Key Result Area Analysis as a means of identifying purpose based user needs.
5. Interpersonal and organisational communications and their implications for information systems.
6. Data analysis and reporting.
7. Reprography.

EVOLUTION OF THE COURSE

The course content as presented above has evolved out of our experience over the last two years. Participants' evaluation of the various courses has indeed been useful in the relative weightage given to different areas and in the introduction of new topics. As an instance the course has progressively included more inputs on data-based systems (not in the sense of machine-readable data based systems but for the storage and retrieval of data, internally generated by organisations as well as environmental data). The course has also progressively emphasized the need to exploit the services of available information systems rather than duplicate resources and efforts of others particularly in the compilation of current awareness services and bibliographies.

SHORTCOMINGS OF THE PROGRAMME

Analysis of the evaluation (See Appendix III for a sample of Evaluation Form) of the course by participants (66 in 6 courses) has revealed gaps in the coverage and treatment of subjects as well as the need to de-emphasize some subjects. A few of the more important suggestions are given below:

1. There is a need to increase content and practice in the organisation of data and data analysis. This need has been felt mainly by participants coming from industries departments, financial agencies and development corporations.

2. There is a need to de-emphasize traditional library practices especially book classification and cataloguing. The argument given by participants is that these jobs are not vital from the point of view of the size of their library collections or from the point of view of their rate of growth. In any case, they feel that these could be handled quite well by trained librarians already existing in some organisations (which are somewhat bigger).

3. There is a need to re-orient lecture sessions on natural language based indexing.

4. There is a need to provide more inputs on user needs identification and personalization of information services.

As a result of the evaluation done by participants the course is being modified to include more sessions and practice in data analysis, use of trade and industrial classifications, key result area analysis of data collected. Key result area analysis is a method used in MBO systems and in the design of Management Information Systems to identify information needs of decision makers. The objectives of such analysis is to identify significant areas of a manager's activity that contribute to the organisation goals and the kind of information he will require to enable him to perform these activities effectively. The storage, retrieval and reporting methods could then be worked out once such needs are identified for the organisation as a whole.

The course will try and integrate concepts and methods relevant to document based information systems as well to Management Information Systems. As a first step in this direction the duration of the course is being extended to four weeks from its present three weeks to provide for these inputs.

THE FUTURE

If the course has to provide real benefits to participants, it must also give to them a concrete plan of action together with a definite idea of what tools and techniques they could apply in their organisations. In other words, mere exposure to principles and methods in information storage and retrieval alone is not sufficient. Such a definitive result is undoubtedly difficult to achieve from the training programme alone — that too of a short duration. What is called for is a follow up by participants and faculty after the course is over so that the dialogue started during the course could be continued and become more purposive.

There are hopeful signs that these expectations are no longer confined to the realms of wishful thinking. One notable example of a successful dialogue is the information cell set up at the Directorate of Industries, Andhra Pradesh. The Directorate sent one of its officers for training at SIET. Following this he was put in charge of developing an information cell at the Directorate. SENDOC staff have been closely associated with the development of the cell and notably in the installation of an edge-notched card system for the storage of data pertaining to small scale industries in the state. Other instances of the impact of the course are seen in the correspondence received from ex-participants seeking advise on their problems.

It may also be mentioned here that two participants of the international courses had prepared project reports on designing information systems for their respective organizations. Both the reports have been substantially approved by their organizations and being given effect to.

Perhaps the greatest impact that SENDOC can make is in turn-key projects for setting up of information cells at developmental organisations — designing the system, selecting the personnel, training the personnel and setting up and making the system operative. There have been tentative enquiries from some quarters and it is hoped that, sooner than later, this cherished hope will also be realised.

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APPENDIX - I

Assignment - I: Information Sources

PART - I

1. Participant's Name

2. Participant's Organisation

3. Given below is an industry or industry group. You are to consult various sources of information discussed in the concept session to collect information under various heads.

Industry/Industry group____________

4. Manufacturers Organisations/Associations in the country representing the above industry/industry group (List atleast 3 of which at least one, a national organisation)

4(i). Source(s) of Information

______________ Page No. __________
______________ Page No. __________

4(ii). List other sources consulted, even if they did not provide the required information.

5. Professional and Research Institute connected with the above industry/industry group. (List at least 3).

5(i). Sources of Information -

______________ Page ______________
______________ Page ______________

5(ii). List other sources consulted, even if they did not provide the required information.

6. Organisations that promote trade for products of the above industry/industry group.

6(i). Source(s) of Information

______________ Page __________
______________ Page __________

6(ii). List other sources consulted, even if they did not provide the required information.

7. Current Periodicals, Indian and foreign, dealing with the above industry/industry group. (List at least 8)

7(i). Source(s) Consulted:

______________ Page ________
______________ Page ________
______________ Page ________

8 Abstracting and indexing Periodicals covering Periodical and other literature in the areas of interest to the above industry/industry group. (List at least 5)

8(i). Source(s) Consulted:

______________ Page __________
______________ Page __________
______________ Page __________

9. List of reference books of interest to the industry/industry group.

1. Hand Books
2. Directories
3. Text Books
4. Dictionaries/Encyclopaedias

9(i). Source(s) Consulted:

______________ Page ________
______________ Page ________

10. List some general and specific sources of statistical data covering above industry/industry group.

10(i). Source(s) Consulted:

11. Please cite below a few references to write ups that provide information on the status, growth etc., of the above industry/industry group. This write up should preferably relate to 1975-76.

Ref 1.
Ref. 2.
Ref. 3.

PART - II

Make use of the sources listed above and others available in the library to find information on the following:

12. Manufacturers/Suppliers of______________
List 3 names below and also the source(s) consulted.

1.
2.
3.

12(i). Sources of Information:

__________ Page _______
__________ Page _______
__________ Page _______

12(ii). Other sources consulted, even if they did not provide the required information.

13. Licensed Capacity and actual production of __________ in the country.. (latest figures available)

13(i). Source(s) of Information:

__________ Page ________
__________ Page ________
__________ Page ________

13(ii). Other sources consulted, even if they did not provide the required information.

14. Import/Export of ______________ (latest figures available)

Import ________ (Qty. or Value) Year ______
Export ________ (Qty. or Value) Year ______

14(i). Sources of Information:

__________ Page ________
__________ Page ________

14(ii). Other sources consulted:

15. List of 3 manufacturers/suppliers of ________ manufactured in ______________

15(i). Sources of Information:

__________ Page ________
__________ Page ________
__________ Page ________

15(ii). Other sources consulted:

16. List of manufacturers/suppliers of ________ required for manufacturing _______ in India.

16(i). Sources of Information:

__________ Page ________
__________ Page ________
__________ Page ________

16(ii). Other sources consulted:

17. List the Indian Standards available, if any on ______ IS _______ IS _________ IS _______

17(i) Sources of Information:

17(ii). Other sources consulted:

18. List 2 Private Consultancy Organisations able to provide technical assistance and know-how for manufacturing etc.. for the above industry.

18(i). Sources of Information:

__________ Page ________
__________ Page ________
__________ Page ________

18(ii). Other sources consulted:

19. List the names of Research Institutions in India that have developed know-how for ______

19(i). Sources of Information:

__________ Page ________
__________ Page ________
__________ Page ________

19(ii). Other sources consulted:

20. List of the titles of at least two research projects in progress in Indian Universities/ Research Organisations on ______________

20(i). Sources of Information:

__________ Page ________
__________ Page ________
__________ Page ________

20(ii). Other sources consulted:

(This assignment is to be completed and returned by).

APPENDIX - II

INDEXING ASSIGNMENT

Participant's name ____________________

1. You have been given a list of references to periodical articles, reports etc. Most of the items in the list have an abstract indicative of the information contained in the original document.
2. You are to index the items using the post-coordinate indexing method discussed in the concept sessions.
3. For vocabulary control please use the thesaurus mentioned below:

   ____

4. You are to record the index terms and item numbers of Uniterm Index Cards provided to you.
5. Indicate against each item in the list of references all the terms you have chosen to index the item.
6. The following guidelines may be followed in indexing:

   (i) index as specifically as your thesaurus permits,

(ii) apart from choosing specific terms to index an item, also choose generic or related terms to index the item wherever necessary,

(iii) choose as many terms per item as necessary - i.e. as many as required to describe the subject of the document completely,

(iv) you may use terms not found in the thesaurus wherever absolutely necessary,

(v) last but not least try and envisage the possible search queries that an item may answer and then index items so that they may be retrieved in response to such queries.

7. Answer the following:

A. Total number of index cards__________

B. No. of items indexed ______________

C. Average No. of terms per item = $\frac{A}{B}$ = _____

8. Were you able to find terms in the thesaurus for all the indexable concepts in your list.

YES NO

9. If your answer to Qn. 8 was 'No' indicate below the cases in which you had to make use of less specific descriptors in the thesaurus.

Concept	Actual Term Chosen

10 Have you provided for generic and related term approaches wherever necessary. Give a few examples of how you have provided for this

Term chosen for specific approach	Term chosen for related or generic approach
________________	________________

11. Was it necessary to use terms not found in the thesaurus. If so list such terms below:

APPENDIX - III

CONFIDENTIAL

INFORMATION STORAGE AND RETRIEVAL SYSTEMS

Course Dates__________

END-OF-COURSE EVALUATION

(i) This evaluation is exclusively for the use of the Institute to enable it to improve its future courses.

(ii) Please be frank in giving your comments, suggestions and appraisals of the course and related issues.

(iii) Please indicate your major purpose(s) for attending this training programme:

(a)
(b)
(c)

2. Circle the statement that best describes how far the Course has met the above purposes.

5	4	3	2	1
Completely	Almost Completely	Partially	Incompletely	Very Incompletely

3. Please indicate below how valuable this Course is likely to be when you return to your job.

5	4	3	2	1
Extremely Valuable	Quite Valuable	Of some value	Of little value	Of no value at all

4. Circle the one statement that best describes your assessment of the quality of instruction in the course as a whole.

5	4	3	2	1
Very Good	Good	Average	Poor	Very Poor

5. Would you please give us your evaluation on each of the following aspects.

(i) Duration of Course (3 weeks)

Adequate

Course should be longer No. of weeks____

Course could be shorter No. of weeks____

(ii) Concept Session and Assignment Work

(a) Good Balance between Concept sessions and Assignments

(b) More concept sessions needed

(c) More Assignments needed

If you ticked (b) or (c) please indicate below in what areas you would have liked more concept sessions/assignments

____

____

(iii) Discussion Time

More time needed

About right

Less time needed

(iv) Size of Course

Too many participants

Size about right

Too few participants

(v) Level of Treatment

Above my head

About right

Too simple

(vi) Time required for completing assignment

More than adequate

About right

Not at all enough

6. Select the statement that best indicates the novely of the material presented in this course.

Most material new to me

About half was new

Less than half was new

None of the material was new

7. How useful were the different subjects that were dealt with in the Course in relation to the needs of your professional growth and work. Please tick in the appropriate column for each subject.

	Very Useful	Useful	Not Useful
a) Classification			
b) Cataloguing			
c) Abstracting			
d) Indexing			
e) Literature searching			
f) Dissemination			
g) Data Banks & Data Analysis			
h) Communications in Orgns.			
i) Applications of Computers in Information Retrieval			
j) Reprography			
k) Search file media			

8. There are many factors that may contribute to the satisfaction of participants in a training programme of this type. For each of the following factors would you indicate how satisfied you have been.

(i) Hostel accommodation

Very Good

Satisfactory

Unsatisfactory

(ii) Catering arrangements

Very Good

Satisfactory

Unsatisfactory

(iii) Transport facilities

Very Good

Satisfactory

Unsatisfactory

9. Did you find the handouts issued for the course useful.

Very Useful Useful Not Useful

10. If SIET organise another course of this type would you recommend it to your colleagues

11. Please record below any suggestions or comments you may wish to make.

Your Name ____________________

Signature ____________________
(name/signature need to be given only if you wish to)

TABLE I: **Organisational break-up of participants trained**

Sl. No.	Sponsoring Organisation	No. of Participants
1.	Academic and Training Institutions (IITs, IIMs)	9
2.	Industrial Promotion, Development and Financial Agencies and Departments	23
3.	Large Industry	7
4.	Research Development Institutions	20
5.	Other Government Departments	7
	Total	66

TABLE II: **Break-up of Session Timings**

Sl. No.	Area	Time (in hours) Spent on		
		Lectures	Assignments	Discussion*
1.	Information sources and their use	6	8	4
2.	Theoretical basis of information organisation	6	-	2
3.	Practical tools and techniques of information organisation	12	20	6
4.	Storage media and file organisation	6	-	-
5.	Information services	6	-	4
	Total	36	28	16

EXPRESSIONS OF TIME IN INFORMATION SCIENCE AND THEIR IMPLICATIONS: AN OVERVIEW

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I INTRODUCTION

1 Definition

Communication. - Charles Cooley defines communication as "...the mechanism through which all human relations exist and develop -- all the symbols of the mind together with the means of conveying through space and preserving them in time..." [1]. George Lundberg considers communication as a subcategory of interaction, namely the form of interaction using symbols -- gesture, picture, plastic or verbal or any other which would serve as stimuli to behaviour [2]. These definitions emphasise the social function of communication and hence pertinent to this essay.

Information. - In a general sense it is that content (message) which is exchanged when an organism reacts with and adjusts to its environment, and as the environment, in turn, is changed by the reaction of the organism. The emphasis in this essay will be on human reaction.

Society. - In general "society is a system of usages and procedures, of authority and mutual aid, of many groupings and divisions of controls of human behaviour and of liberties. It is the web of social relationships and is always changing" [3].

Time. - Time is a basic concept associated with everyday experience. Generally we speak of it in terms of when an event occurred or would occur or how long it takes. We also measure it in terms of, for example, the position of the hands of a clock, readings in a calendar, etc. Ackoff's functional definition of time as a "property of events that is sufficient to enable an individual to individuate any two changes ~~in the~~ same property of the same individual" [4], is helpful.

Human perception of change and of temporal succession of events involves acts of mental organization. Our awareness of the sequence of events depends on the sense with which we perceive them. Therefore, time is not a simple sensation but depends on processes of mental organization uniting thought and action. The mechanism of memory is one of the unsolved problems of the science of time [4a]. Memory is an important subject of study in psychology, and the study of the attributes of memory (human memory) and its simulation is a major subject of interest to information science in building up its foundations.

2 Information Science

Information science covers studies on the theoretical and practical aspects of the following:

- generation and growth of information in different environments.
- collection, storage, organization, and processing of information to facilitate access to and use of, information.
- dissemination, diffusion and transfer of information in different user environments.
- use, abuse, and impact of information individuals and communities in different contexts.
- design, development, and management of information systems and services, manual and machine-based.
- social, economic, political, and legal features of information and information systems.
- education and research in information.

In such studies information science has necessarily to draw upon a whole spectrum of other disciplines. For example:

Based on a paper presented at the symposium on Time and the Sciences, London, 4-6 February 1976, organized by Unesco's Division of Philosophy and the International Union of the History and Philosophy of Science.

- -- mathematical and other methodological sciences in formulating models, equations, statistical indices, etc., of growth, diffusion, transfer, and organization of information.
- -- physical sciences, in considering analogues of the phenomena of movement and diffusion, structure, communication, and entropy in the information field.
- -- biological sciences, in considering analogues of growth and ageing phenomena of information; genetic epitemology, modes of knowledge and discipline formation; neurophysiological and biocybernetic aspects of information processing and flow.
- -- linguistic sciences, in expressing, structuring, coding, and communication of ideas and information.
- -- behavioural sciences, in the study of human behaviour in the generation, search, acquisition and use of information.
- -- social sciences, in the study of the sociology of information production and distribution, the economics of information, the socio-political, legal, cultural, and management aspects of information availability and utilization.

In a consideration of the expressions of time parameter in information science studies, three factors appear to be interesting:

- -- the qualitative and quantitative expressions of time in the information field based on analogues and models largely borrowed from other disciplines.
- -- Time as a unifying and correlating concept among a variety of disciplines including information science.
- -- changing patterns and developments in the information field which have a time parameter implicity or explicitly associated with them, and their implications to and impact on individual and group behaviour.

II TIME-BINDING AND COMMUNICATION

1 Social Function of Communication

The social function of communication implied in Cooley's definition (vide I, 1) is the ensuring of continuity in society through access to the experiences and ideas of the past expressed in symbols for transmission across space and through time. This is the "time-binding" function of social communication. In the 1920s, Alfred Korzybski [5], the founder of General Semantics, proposed a theory of organic and human behaviour, based on binding ability, which provides an insight into the links and differentiation between plant, animal, and man. During the past decades, studies in cybernetics, thermodynamics, ethology, neurobiology, etc., have provided supporting evidence and data for the theory. "Binding" in the Korzybiskian sense means "tying together", "using", "structuring", and "transforming". The binding attributes of plant, animal, and human species are summarized in the following table.

Binding Ability of Plant, Animal, and Man

Organism	Binding ability	Remarks
Plant	Energy binding or chemical binding	Relatively immobile in space; incapable of complex organization, group behaviour, and communication (symbol usage). No knowledge resources and culture.
Animal	Energy binding and Space binding	Capable of limited movement and of simple group behaviour mainly to satisfy biological needs. Incapable of communication from generation to generation through symbol usage. No knowledge resources and culture.
Man	Energy binding, Space binding, and Time binding	Capable of complex behaviour, communication of information, creation and transmission of culture across space and through time using symbols. Transcends space-binding genetic animal background.

Man's time-binding ability arising from his usage of language, number, gesture, picture, and other symbolic forms enables him transcend the limitations of inherited characteristics and the seemingly insurmountable barriers of 'time' and of 'space'.

The insight, the wisdom, the culture and the arts, the ideals of political, economic, technological, and social structures of the world, and the variety of human values and as cultural inheritance and competition -- that is, competition in, with and for, symbolic forms used in communication. Intra-species competition reduces the chances of survival of the species. Therefore cooperation within species is essential to the physical survival and time-binding culture transmission activity of man. Man is a link in the vast transmission line through time of the culture [7]. As Norbert Wiener points out, the cultural community extends to the extent there is an efficient and usable flow of information.

Knowledge and culture transmission and perpetuation-in-time of society is secured not only through oral communication, but also through various social structures and forms: "... rites and rituals, sacraments, ceremonies, and institutions. Language is itself one such institution and the continuity between speech, writing, print, books, and libraries defines language's time-binding institutional function. Other institutions include the family, the temple, economic, social, and political systems, education, industry, agriculture, art and science, moral codes, legal codes etc, uniting people in cooperating, communicating time-binding civilization" [7].

III SOCIETAL HOMEOSTASIS

1 Information and Entropy

Human society can be looked upon as a dynamic open system consisting of individuals, groups, organizations and institutions of various kinds in continual interaction and interchange of energy and messages (information). Here, we shall primarily consider semantic interchange. Open systems have certain common characteristics, such as the following [8]:

Input. - Import of energy from the environment. Man as a biological and social entity seeks and inputs energy and information necessary to satisfy his biological, emotional, intellectual, spiritual, economic, and cultural needs.

Throughput. - The input is processed by performing work and is converted into the output. Man himself is an information processing system. He has also created various information processing systems to help him.

Output. - Inference, data, ideas, description, information, knowledge, documents, etc.

Cyclic character. - Input, processing, output, feed-back, control, adjustment, and adaptation -- each phase supports the next in a cyclical way. From this succession of events in time arises the interrelationships of the pasts of the system and of their functions.

Negative entropy. - According to the second law of thermodynamics the universe is running down. The energy loss or increase in entropy corresponds to the positive direction of time. This time's arrow [9] or probability vector, affects the physical, biological and commmucative patterns in the universe. Norbert Wiener points out [10]:

> "As entropy increases, the universe and all closed systems in the universe, tend naturally to deteriorate and lose their distinctiveness, to move from the least to the most probable state, from a state of organization and differentiation in which distinctions and forms exist, to a state of chaos and sameness ... Order is least probable, chaos most probably. But while the universe as a whole ... tends to run down, there are local enclaves whose direction seems opposed to that of the universe at large and in which there is a limited and temporary tendency for organization to increase."

Some of Korzybski's time-binding agents, man in particular, constitute these local enclaves trying to maintain order. The commands through which man exercises control over his environment are a kind of information imparted to it. Increase in the supply of information increases negative entropy, helps to reduce uncertainty, imposes order, and prevents the system from tending towards chaos and disorganization. Laslie White comments in a similar vein from the zoological standpoint [11]:

> "... culture is the means of carrying on the life process of a particular species, Homo-sapiens. It is a mechanism for providing man with subsistance, protection, offence and defence, social regulation, cosmic adjustment, and recreation. But to serve these needs of man, energy is required. It becomes the primary function of culture, therefore, to harness and control energy so that it may be put to work in man's service. Culture thus confronts us as an elaborate thermodynamic, mechanical system."

Information input, negative feedback, and coding. - Negative feed-back is the information on what is wrong, if any, with the system, necessary for making adjustments and take corrective action. Signals received may be expressed as codes. Man has evolved elaborate coding systems to facilitate communication.

Steady state and dynamic homeostasis. - The change in the attributes of the parts of the system over a time period t_1 to t_2 may not be drastic (steady state). On the other hand, information received may cause substantial impact, even cognitive dissonance, on the individual.

Just as the human body is kept in dynamic equilibrium -- that is, homeostasis -- through cell cooperation and communication, so also human societies depend upon cultural communication for their homeostasis. Therefore, cooperative behaviour patterns and the resulting meaningful effective human relations have a high survival value. And these behavioural patterns are based on the act of symbolic communication.

Differentiation. - Division of labour and specialisation of functions and roles of the different parts of the society necessitated by the growth in time of the size of society and complexity of its demands as it evolves from one stage to another adapting and adjusting.

Equifinality. - The possibility of attaining the set goals of the system starting from a variety of initial conditions, by adopting suitable alternative means.

The different phases of the system's working are time-dependent and processes/events such as entropy and steady state are referred/defined specifically in terms of time and information communication.

2 Societal Cohesion and Communication

Human civilization and culture, organizations and institutions are held together over time in a network of mutual dependence and responsibility and the sustaining transactions carried on by myriads of messages communicated over this network. These messages form the basis as well as the regulating, organizing and time-binding influence in social evolution and progress. A failure in communication could lead to misunderstanding, misinterpretation and confusion of the import of the message [12]. In turn, these may cause alienation, aggression and detraction from human progress. Here, communication connotes a deep dynamic and complex series of processes operating together -- the whole range and cycle of perception, memory, information analysis and processing, symbolic transformation, delivery and feedback -- that guide human behaviour towards and transactions with, the physical and social environment. The blending of the resources of cybernetics, information theory, general systems approach and general semantics with those of science and technology has extended human foresight, predictive capacity, and planning capability to guide social intervention and reform. Man, thus, appears to be moving toward influencing the future and directing his own evolution.

IV TIME IN COMMUNICATION PROCESS AND KNOWLEDGE GROWTH AND DIFFUSION

1 General Systems Approach

As an approach to the organization of general systems theory Kenneth Boulding suggested "to look over the empirical universe and to pick out certain general phenomena which are found in many different disciplines, and to seek to build up general theoretical models relevant to these phenomena"[13]. Examples of such common phenomena are: population dynamics, growth-in-time, relative growth, entropy, competition, information diffusion, etc. Selected models of growth-in-time and of communication of information and knolwedge are mentioned here.

2 Growth-in-Time: Exponential and Logistic Patterns

Patterns of growth-in-time showing isomorphism of law in different fields are the exponential and the logistic [14]. For example, growth of science and technology, increase in the knowledge of number of animal species, yeast cells in a controlled environment, publications on drosophila, of manufacturing companies, etc. Isenson [15] has shown that the rate of growth of knowledge over time can be expressed as an equation embodying various limiting factors such as the upper bounds imposed by natural law, political and social constraints, the contemporary level of scientific and technical understanding and the ability of the scientific and technical communities to communicate their new findings. The equation is: $dk/dt = p(t)*Q*bNi(t)[1+Ni(t)]$

where

$p(t)$	is the probability that a given scientist will make a contribution during an increment of time t, and is a function of the state of the art relative to limits imposed by natural law; $p(t)$ may be thought of as a function of $(1-K(t)/K^o)$, in which $K(t)$ represents the current state of the relevant art and K^o some natural limit such as the velocity of light.
Q	is a measure of the mean productivity factor per scientist or engineer
$Ni(t)$	is the number of scientists and engineers actively engaged in the i^{th} and related fields.
b	is the communication factor, a measure of the ability of each scientist to keep up with all the developments in his specialisation, and takes a value between 0 and $\frac{1}{2}$.

As several studies have shown, the size of recorded knowledge (literature) in many of the scientific fields doubles, on an average, about every ten years. But exponential growth must have ceilings because of various constraining factors. Otherwise, the growth would reach absurd conditions in the future. And this results in the familiar logistic pattern of growth.

Exanples of such logistic functions and curves are:

$$\frac{p(t)}{Po} = 1 - \exp\left(-\alpha T \exp\frac{t}{T}\right)$$

$$\frac{p(t)}{p^o} = 1 - (1 + \beta t) \exp\left(-\frac{t}{T}\right)$$

$$\frac{p(t)}{p^o} = \left[1 + \gamma \exp\left(-\frac{t}{T}\right)\right]^{-1}$$

p being the number of papers, the real parameters α, β, γ permit appropriate adaptation to concrete distributions. The logistic growth curve may not be a normal S-shaped ogive. Historical time series analyses present variants of the curve as seen for example, in the growth of science and technology. Hunting fluctuations and the escalating curve are two examples. The constraining factors causing the variant shapes and the implications to the sociology of science have been the subject of study by De Solla Price [16].

Paul Weiss presents a knowledge growth model on the analogy of the growth model of an organism [17]. Various models of the growth of knowledge over time and their social implications have been examined by Diana Crane [18].

In an investigation of the nature of scientific literature, Price considers it as a network which shows some interesting properties such as the formation of "research front", factor of "immediacy", and growth and decay (obsolescence and half life). The study of such characteristics help to explain, in some measure, the patterns of communication, and cumulation and transfer of scientific knowledge over time [19].

3 Technology Growth: Boltzman Equation Model

Hartman found an analogy between chain nuclear reaction and technology growth. He has suggested that a model for the technology forecast can be derived directly from Boltzman equation [20]. Scientists and engineers are pictured as being immersed in a sea of information, the information being a necessary input for the generation of new information (technology). His thermodynamic model simulates authors by stationery atoms and information carriers by electrons accelerated by an electrical field. A bit of information may collide with a researcher and trigger a new idea or it may not. As it is not possible to predict what piece of information will collide with which researcher and whether a particular collision will be "elastic" or "inelastic", the process is only statistically definable -- providing an acceptable parallel for forecasting technology growth.

4 Information Diffusion: Heat Conduction Model

Avramescu describes [21] a mathematical model for scientific information transfer on the analogy of heat diffusion laws. The information flow equation is similar to Fourier's. The information diffusion process is a multiple chain, one scientific paper stimulating another. The elementary space elements are papers linked together by references and citations in a natural time sequence. Fourier's law, written in linear form $q = - \lambda \partial u / \partial x$, expresses information in space and time as function of growing interest directed from source papers to affected new ones. If λ = constant, the flow is 'linear' and the superimposition principle of single chain would hold. The space coordinate x marks the successive generation of papers p beginning with any selected initial time t = 0. Thus, x is proportional to the cumulative number of papers P.

Extending the heat diffusion analogy, information flow would also exhibit another attribute -- accumulation capacity. Thus, $q = k. \partial u / \partial t$, where k is a capacity factor, that is, accumulated information flux per time and space unit, which increase the interest of a user in proportion to his own "capacity" for receiving and processing new information. Using Fourier's homogeneous partial differential equation, it may be shown that diffusion becomes easier when the space elements are more conductive or permeable and when the greater absorbing capacity of the receivers does not reduce the available information. The parabolic differential equation implies: time variations of scientific interest are proportional to the interest variations around any space point, eg. a scientific paper. Discussions about a paper or interlinking between papers enhance interest, concentrate citations and raise the value of any true creative activity.

5 Communication Process: Epidemic Model

Communication, like other processes, is a time-dependent phenomenon — a sequence of events resulting in the transmission of information from a source to a recipient. William Goffman and V A Newill [22] in formulating a generalised mathematical model for the communication process and its associated information systems, consider three problem areas: behavioural, representational, and technical. The mathematical theory of communication developed by Claude Shannon and others [23], deal mainly with the technical problem. Siegfried [24] has dealt with the close parallel between the transmission of disease and the transmission of knowledge. Goffman points out that "because the principles underlying the spread of infectious disease also govern the diffusion of information and the spread of knowledge, a communication process can be represented as an epidemic process". Thus, in developing a mathematical theory of the communication process, the Goffman-Newill model defines the process in terms of a set N (population of objects) together with an agent i (information) which is conveying ideas (infectious material) among the members of N; the members of N pass through a set of states s (susceptible, infective and removed) and the entire process through a set of states S (stable and unstable) with respect to time t. Control system theory is applied to study the growth, decay and stability of such processes. Information retrieval corresponds to processes that enhance the spread of infection by increasing the contacts between infectives and susceptibles. A communication process C can, thus, be formaly expressed by $C = \langle N, i, s, S{:}t \rangle$. Goffmann has shown the use of the mathematical model to establish relative importance of existing lines of research to the development of a given scientific topic, forecast their future behaviour and forecast the emergence of new important lines of investigation. Fairthorne, in a review [25] of the empirical hyperbolic distributions used in bibliometric description and forecasts, such as those named after Zipf, Pareto, Bradford, Willis, Berger-Mandelbrot, and others, most of which are samples or instances of a family of statistical distributions studied by Paul Levy in 1925, points out that the Goffman-Newill model is, perhaps, the only one involving time explicitly.

6 Idea Diffusion and Social Structure

The usual logistic model of the process of diffusion/growth of ideas in a field could be considered as a simplified contagion model. It assumes seeding and contains only a contagion part. In deterministic form, it may be expressed as:

$$\frac{dn}{dt} = \beta . n(N-n)$$

where N is the population size, n the number of people who have the idea at any time (the haves), N-n the number of havenots, t the time and β the interpersonal diffusion parameter.

Social diffusion process is usually too complex to be reduced to a mechanical contagion process. The diffusion occurs through : (a) scientist-scientist direct informal contact; (b) scientist to scientist contact through an intermediary such as information scientists, scientific editors etc; and (c) combination of (a) and (b). The assumption of an inter-mixed population implies that each person has equal number of contacts with each other person. This may not hold good, it is not a random process. The diffusion may take place only in a tight little in-group: for example, the group of haves which may be people who have a great many contacts with each other, but few with the havenots. This aspect of social structure preventing complete intermixing shows the diffusion process. Generally, the slowing down rate is different at different stages of the process [26]. Investigations in progress for some types of incomplete social structure occurring in scientific communication (eg. the invisible colleges, and partially interpenetrating interdisciplinary research groups) has been reported by Le Coadic [27]. Le Coadic points out that the "formal part of the process requires structural measures and the mathematical model characterizing such a process must somehow take into account the varying degree and kinds of connectness in the social structures they are meant to characterize. It is necessary to determine the timing, sequence and diversity of the formal information flow and the characteristics of the dissemination (scientific libraries, scientific journals ...) and of the users of each element of the information system in order to identify those elements which are critical and to establish the functional characteristics of the system as an entirety. Consequently, a general formulation of the differential equation that describes this social diffusion process is:

$$\frac{dn}{dt}(x, y, t) = \alpha(N-n) + \beta . n(N-n) + \gamma . \sum n + D . \Delta n$$

where α is the constant source diffusion parameter. β is the interpersonal diffusion parameter, γ is the inter-group diffusion parameter, which measures the degree of inter-penetration, $\sum n$ is the number of persons who have already adopted in the total system, is the spatial diffusion parameter and Δn is the Laplacien of n.

$$\Delta n = \frac{\partial n}{\partial x^2} + \frac{\partial n}{y^2} = \text{dir} \ (\overrightarrow{\text{grad}} \ \underline{M})$$

x, y are spatial coordinates.

7 Idea Acceptance: Time-dependent Models

Related to the concept of diffusion of ideas is the concept of acceptance of ideas by a target group. Morphet [28] has presented a probabilistic model of time-dependent factors governing the acceptance of innovative ideas by industry. Within this framework is analysed the timeliness factor that partially governs the receptivity to innovative ideas of industrial organizations.

The model is based on the assumption that: (a) Even the best innovations do not diffuse by themselves; (b) The commitment of an organization to existing practice will only favour innovation when existing practices become obsolete. The occurrence of such obsolescence is identified with the concept of the New Idea Point (NIP), the point in time at which the organization must have assembled a portfolio of innovative ideas in order to maintain continued existence. The reaction of firms to new ideas between NIP, is associated with the organizational ambivalence - a tension between action and reaction, between need and conservatism - which must be periodically resolved in order to meet the imperatives of the NIP.

The pattern of variation of the attitude of a firm between NIPs is portrayed as a variation in the probability that the firm will incorporate new ideas into its portfolio. To express this, the concept of Idea Collection Curve (ICC) is used. On the assumption that an idea-source can probabilistically locate imminent NIPs in potential users, an optimum timing for the approach to the organization is derived in the model.

8 Innovation Diffusion Models and Sociological Implications

Everett Rogers and others have attempted generalization of the mode of diffusion of research results in the "market" over a period of time. An innovation is defined as an idea that is seen as new by individual. Thus, innovations include 2, 4-D weed spray among farmers, a new drug among physicians, the IUCD birth-control technique among peasant women in India, a new education technique among teachers, and so on. The crucial elements in the diffusion of innovations are deemed to be (1) the new idea; (2) the communication channels; (3) the particular social system; and (4) time. The element of time distinguishes the diffusion studies from other types of communication studies. Time is involved in the following ways: (1) the innovation decision period through which an individual moves from first knowledge of the innovation to persuasion of its usefulness, to its adoption, and continued use; (2) the rate of adoption of the innovation in a social system, measured as the number of adopters per time period; and (3) the innovativeness or the degree to which an individual is relatively earlier than other members of his social system to adopt new ideas. Factors helpful in accelerating the diffusion and adoption of new ideas/innovations such as, altitudinal type variables, social relationships and strategies adopted by change agents, have also been studied [29].

Other similar models of innovation diffusion over time are those of Clark and Guba and the CASTASIA Model. The diffusion studies of the Centre for Research Utilization of Knowledge, Michigan University, are also relevant [30]. Some of the barriers to the communication of new ideas/innovations are mentioned in section VIII.

Findings of diffusion research have implications to technology transfer programmes, new product marketing, educational innovation spread etc.

9 Acceleration of Innovation and Knowledge Obsolescence

World War II and the events that followed it provided a great impetus for scientific research, innovation and technological change which, in turn, contributed in a large measure to socio-economic change. For example, research in the field of electronics lead to radar and improved communications, computers, early warning systems, control systems, space explorations, and new commercial materials and products. Some of these innovations, particularly in communication and information technologies, enabled greater interaction among researchers and innovators which, in turn, further accelerated the scope and pace of scientific and technological enquiry and innovation. It is estimated that half the total of scientific research conducted in the United States has been done since 1965. Similarly, in UK more than 50 per cent of all new products have been based on scientific and technological discoveries and innovations since World War II. Illustrative data are presented in another paper [31].

In addition to the expansion in the scope of scientific inquiry, there has been an appreciable acceleration in the rate at which new knowledge is put to use. This has resulted in an acceleration in the rate of knowledge obsolescence. The Department of Commerce (USA) estimated that prior to World War I, there was an average wait of 33 years between invention and its application. By World War II, the time lag had dropped to 10 years; and now it is even less. Illustrative data on the rate of obsolescence in different fields are presented elsewhere [31].

Killingsworth, Lynn, and others [30] claim that, in general, considerable acceleration has occured in the rate of diffusion of new knowledge between the early part of this century and the inter-war period with a further acceleration after 1945, although the time-lag from invention to innovation may vary from one field to another. The reasons for the acceleration of diffusion of technology are said to be:

(a) Development of a variety and improved channels of communication of information;

(b) Development of more sophisticated methods for determining the time at which equipment should be replaced, and

(c) Greater receptivity for newer ideas and techniques.

Other findings of the Lynn study include that:

(1) The time lapse between innovation and its utilisation in industry is much shorter for consumer products than for industrial products;

(2) Time lapse is shorter for invention developed using government funds than those using private funds; and

(3) The technology diffusion and transfer time is reduced if the innovator himself undertook the development.

What are the implications? A major change which might have required 5 years to implement a decade ago must now be completed in a shorter time period, if an organization, particularly an industrial or commercial organization, is to remain competitive. On the one hand management reaction time is constantly shrinking, while on the other each decision may involve more risk (because of a large number of variables internal and external, to be taken into account), and is valid only for a shorter time span. Therefore, as reaction time diminishes, opportunity for gainful action may be lost, because preoccupied managers and policy makers may fail to reach out and grasp them.

V TIME AND INFORMATION SYSTEMS

1 Zipf and Bradford Distributions

Since 1960 in the field of bibliometrics two classes of empirical laws have been used fairly frequently. These are the Zipf and Bradford laws [32] both of which are hyperbolic distributions. One of the other laws is used depending upon whether one's interest is in vocabulary or in periodical literature, or physical access time, in the rate of diminishing returns in bibliographical search or in the cumulative yield from a given input. The hyperbolic behaviour, that is, the product of fixed powers is constant, has been noticed for over a century in widely different fields.

In 1916, Estoup [33] noted an empirical relation between the rank of a word in order of frequency, and the frequency of its appearance in a fairly long text. The scope of this observation has been considerably developed and extended by Zipf. The rank of a word r is the number of words, including itself, that have at least the same frequency, f(r), of occurrence. The Zipf distribution can be expressed as:

$f(r) = k/r$ (k approx 0.1)

The time factor involved here is in the explanation of the observed relation in many fields on the basis of the general principle of Least Effort. Two derivatives from the Zipf distribution may be mentioned as illustrative examples.

The equation $n(u) = Ku^{-2}$ derived by Parker-Rhodes and Joyce [34], gives the number of words n(u) in a given vocabulary that occur in a long enough text with relative frequency u. This relation is the same as the Lotka's distribution equation for literary output of authors [35] in a given period of time. Parker-Rhodes and Joyce derivation is based on the assumption, among other things, that "words in the vocabulary are stored and scanned in order of decreasing frequency, that the duration of scansion is proportional to the number of words scanned, and that the language concerned evolved so as to give maximum variety (information) for a given duration of scansion" The maximum liklihood methods is used to derive the equation. The Zipf distribution of exponent unity is arrived at by using information theoretical or statistical methods.

A D Booth [36], assuming a Zipf distribution of book usage, supported by empirical evidence on library borrowing, arrived at the optimal least-frequent most-distant arrangements for the layout of bookshelves and arrangement of books in libraries to optimise access time. He inverted the Parker-Rhodes and Joyce argument. Booth suggests the possibility of some equivalent mechanism for average minimum access time in human cognitive process.

Fairthorne expounded and applied the Least Cost Principle to several problems in documentation and retrieval, from coding through the power required by different alphabets, to the arrangement of books on shelves.

2 Document Life Parameters

It has been observed that if all the citations in a single issue of a periodical or a volume of it for a particular year, are sorted according to the date of the cited documents, then the number falls off rapidly as we move back into time. Since 1960 several studies of this type in different subject fields have been done [37]. From these studies several time-related parameters of "periodical's life" have been isolated. The following are examples.

Half life - the time period, actual or expected, during which half the total use of an individual item constituting a literature has been or is expected to be, made.

Item half life - The time period, actual or expected, during which half the total use of an individual item constituting a literature has been or is expected to be, made.

Median citation age (Apparent half life) - The time period during which half the citations in a citations study occur.

Corrected half life - the half life as estimated by removing the growth element from the median citation age.

Obsolescence - The chance of an item being currently used declines with age. Obsolescence rate is the rate at which liklihood of use declines with age

Obsolescence factor - The factor by which the active life of a literature of a subject field appears to decay annually, as calculated from the number of articles cited in successive years.

Corrected obsolescence factor - The factor by which the active life of individual items in a literature tends to decay annually

Annual ageing factor and Utility factor are other similar useful concepts.

Formulae for determining the above parameters of documents have been worked out and applied by Maurice Line, Brookes, Vickery, and others. The values of the parameters can be used for guiding library management decisions: for example, maintenance of library collection (periodicals, books etc), withdrawal of documents from active circulation, planning of acquisition programmes within a hierarchy of library systems, and identifying significant research in a field.

The Goffman-Newill epidemic model has been mentioned in section IV.5. Fairthorne has reviewed empirical hyperbolic distribution of the Bradford-Zipf-Mandelbrot type used in bibliometry [25]. An interesting use of the Bradford distribution is to check on the completeness of a bibliography. For any subject it is necessary to analyse the productivity of only the most productive periodicals as determined by the Bradford ranked series in order to estimate the complete bibliography. This helps to save time and effort in estimating the size of the

literature in the field and the cost of covering the whole or any specified portion of the literature.

Avramescu [21] reports on the deduction of the Bradford's law from the main solution of the heat equation.

3 Waiting Time

In the management of any system including an information system, ensuring receipt of the item sought by the clientele with minimum delay and cost, is an important consideration. The 'waiting time' - the subjective or psychological time - is of special concern here. For users of an information system this may arise in one or more of the following stages: (1) Physical/communication access to the system; (2) Identification and access to the appropriate data base; (3) Use of the tools and techniques to search in the data base to select and retrieve the relevant information/surrogate; (4) Document information delivery; (5) Document/information usability.

Delay in physical access to the system may arise from inadequacies of the transport and/or telecommunication system. Delay in the access to the data base may arise from defective organization or from restrictions on access, or inadequacy in the user capability. Information systems and the tools and techniques used tend to become complex and unless the user is familiar with the sophistications, the use of tools and interaction with the system may involve more time and delay in getting the desired output from the system. Physical access to document and translation into the language of the reader are other familiar delay factors. There have been some discussions of the time factor in library and information management.

A variety of improvements are being progressively incorporated into information systems, manual and mechanized, to secure quick access to relevant information and documents at reasonable cost [38].

4 Temporal Dimensions of Classification

In Fairthorne's interesting paper Temporal structure in bibliographic classification and Phyllis Richmond's commentary on it [38a], attention is drawn to relation of each text to a fan of earlier texts and to later ones, a factor which the classifier uses in assigning a document or discourse to a subject class. From the internal characteristics (subject treated) of two documents, it is possible to discuss whether one is a descendent of the other. "A documentary corpus has a distinct order which is in bibliographic time, not necessarily the same as physical time. Bibliographical time is the time in which the documents presented themselves to the reader or author. This time has no relation to the time of publication." The lapsed time between the two events may be due to communication delay.

One can see the relation of Fairthorne's fan history idea to Kessler's concept of "bibliographic coupling" [38b], bibliographic search using citation indexes [38c], and automatic classification of documents or discourses using citation clusters.

VI RESEARCH COMMUNICATION: SOCIOLOGICAL AND BEHAVIOURAL ASPECTS

1 Overemphasis on Speed?

Timely availability of relevant and reliable information and data is important to the researcher, the production engineer, as well as the manager and planner as an aid in solving problems, making gainful decisions, minimising the chances of unnecessary duplication of effort, and triggering of new ideas [39]. With the increasing demand for information and data, there has been a phenomenal growth in primary information sources, such as books, articles, reports, conference proceedings, etc. In finding ways and means of moving information from the point of generation to points where it will have use, the need for speed of communication has been emphasized. For instance, reducing the time-lag between submission of a paper to a periodical and its publication. Growth in the number of primary periodicals, publication of short communications, minimising editorial and refereeing work, adoption of fast printing techniques are some of the results of such considerations. There have been salutory as well as undesirable effects of the ever-increasing quantity of information that hits the researcher at an apparently ever-increasing speed.

Ziman points out that in the pure sciences the supposed wastage of resources through duplication of effort is somewhat exaggerated. Simultaneous discovery arising from concurrent work on the same problem by different researchers is not a bad thing in itself. It provides for a good means of confirmation of the findings or discoveries; the routes taken to the discoveries by the different researchers may be different. Experiments may be repeated to improve techniques, increase accuracy of data, etc Also, "the speed of research" varies at different stages, from discipline to discipline and the "speed of supply of information" should correspond to this variation in demand. Ziman writes [39]:

> "What are the time constants of research? These have not been studied in great depth; and probably vary greatly from one discipline to another. At the peak of a revolution, for example, as depicted by Watson in "The Double Helix", a few days or weeks may see the breaking of the wave; on the other hand in the formulation of the question to be answered, a decade may not be too long for successful rumination and significant progress. In general, I would confirm the observations of Garvey, who found that the various stages of hypothesis, design of apparatus, experiment,

testing, confirmation, critical analysis, informal discussion, writing up and so on, take months or years to complete, so that the interval of about four months between the receipt of a typescript and its publication in a reputable journal is not a significant proportion of the time required to 'make the discovery'."

Fundamental formulations and important research results which amount to a breakthrough or set a new paradigm in a field, should, of course, be disseminated as quickly as possible. Such starling discoveries are, however, few and far between so that existing quick reporting means may be adequate. What is deprecated is the overemphasis on speed of communication of "research" results leading to a mushrooming of primary publications, and publication of unreferred and poorly edited papers. The information seeker's time and effort are wasted in wading through a flood of redundant and not-so-reliable information and data to select those that are really important contributions to the field.

In spite of these depreciations, the rate of proliferation of documents and information exchange media has gone on unabated. The 'publish or perish' syndrome is bound up with many questions in the sociology of science (e. g. achievement of a scientist, especially the newcomer to a field, being estimated on the basis of the number of papers published by him, the economics of research and the ratrace for grants, the behavioural aspects of researchers to "scoop the field" as if in competitive business to ensure priority of "discovery" which, in turn, could bring more projects and grants), the economics of the information industry etc.

De Solla price remarks that

> "Colleges demand that scientists publish or perish; payment of research funds entails the production of research reports as something more than a fiscal document. Publication becomes a responsibility consequent upon the spending of time or of money rather than a privilege consequent upon finding something worthy of the noble archive and the attention of one's peer's ... In the new situation scientists will tend to grasp at all devices to facilitate publication even at the cost of archival value or research communication efficiency. "At the research front the pay-off of rapid communication becomes so great that traditional formal mechanisms for broadcast dissemination are increasingly restrictive and new solutions are found to facilitate information and highly selective insect-borne pollination by the busy bees of the invisible colleges" [40].

The sociological and human aspect of science also throws some light on the motivations of the scientist for quick announcement and speedy communication of his work. The motivation is to establish and maintain intellectual property. Robert Merton from his study of such priority claims and disputes over intellectual property over the past four centuries, finds them a fairly common feature in the history of science. Duplication of discoveries is a widespread phenomenon [41]. The nearly concurrent discoveries resulting from several persons in different parts of the world simultaneously working on the same problem may be a result of quick communication or absence of it. Duplication may be particularly frequent when a research area becomes nearly saturated, another reason for the flattening of the exponential growth curve. Price infers that "First, scientific communication by way of the published paper is and always has been a means of settling priority conflicts by claim-staking rather than avoiding them by giving information. Second, claims to scientific property are vital to the make-up of the scientist and his institutions. For these reasons, scientists have a strong urge to write papers but only a relatively mild one to read them" [42].

The issues discussed above relate to communications in "pure" sciences, the situation is somewhat different in the applied and development research areas. Here one seeks the best available solution to a particular problem, and the rewards of success or cost of failure may be measured in thousands of dollars [38]. Timely information and data helpful in making gainful decisions is vital in competitive industrial research. Speed of movement of information through documentary and nondocumentary media is obvisouly essential in this context. Here too, however, (perhaps even more so than when the users are researchers in the pure disciplines), when users are research managers, production managers, etc, the information system should not only be capable of picking out quickly the most relevant data and information, but also present them in a manner -- eg, digest, technical note, trend analysis with charts and graphs -- which will immediately show the relevence of the information to the activities of the organisation in general and to the special interest and activities of the individual concerned, in particular. Such repackaging of the information and data would facilitate reaction of the individual to the perceived situation in the context of a rapidly decreasing management reaction time to environmental changes.

Ziman points out that "hindrances to the immediate spread of new knowledge (in applied and development research) are not then so much in the machinery of publications, but rather barriers of secrecy deliberately raised around industrial and military research. The communication system of technology is quite different from that of pure science, having different ends, different norms, and altogether different standards of morality".

2 Behavioural Aspects

The expose in Watson's Double Helix presents a part of the human side of research workers in hot pursuit of an idea which is known in advance, to be a breakthrough. In a recent study, Ian Mitroff [43] among other things, examines the changes in the attitude and behaviour of scientists in relation to particular hypothesis, held by them, due to the availability of information and data at different points of time on the object of their hypothesis. The scientific issues considered are: Origin of the moon, temperature history of the moon, origin of mascons, and lunar and terrestrial tektites. Information available on the issues in relation to point in time: before Apollo Mission 11, after Apollo Missions 11, 12, 14 (Now) and after Apollo Missions 14 and 15 (Later). It is shown that "for each issue, the spread of the statistical difference between the various competing hypotheses continually increases over time".

Mitroff also considers the shift in scientific attitude as a problem in information transfer over a time period. Using Henri Theil's equation [44] it can be shown that in a system of mutually exclusively events E_1 ...... E_n with prior probabilities P_1 ...... P_n the expected information of the message which transforms the prior probabilities to the posterior probabilities q_1 ... q_n is given by the expression.

$$I\,(q{:}p) = \sum_{i=i}^{B} q_1 \,.\, [\log_2 (q_i/p_i)]$$

In the case of the hypotheses about the moon, the hypotheses are taken as the events (E), the attitudinal judgements on the various hypotheses as judgements of their respective probabilities, and the Apollo Missions as evidence messages that transform the probabilities. Using the equation, the information transferred between the time periods as a result of the Apollo missions can be computed.

In an approach parallel to the moon hypothesis studies, Kenneth Arrow and others, have been examining how the amount of information processed by businessmen, consumers, stockholders and other 'economic actors' influence their behaviour on the stage of the economic system. It is worth nothing that Theil's equation mentioned above comes from a paper on the use of information theory concepts in financial statements analysis. Such considerations and looking upon information as a key resource, the "information revolution" is influencing the pattern of thought in several fields -- economics, political science, government, sociology etc. Economists are attempting to formulate a new economics of information and over the past decade it has ranged over a wide spectrum of activities in the information field -- from the study of specific activities of libraries to a reconsideration of the role of information in the economic system [45], the welfare economics of symbol manipulation as Jacob Marschak calls it [46].

VII THE EMERGING INFORMATION ENVIRONMENT

1 Fusion of Computer and Communication Technologies

The combination of innovations of the communications field, such as CATV, CCTV, satellite, digitised transmission of graphic and audio inputs, image technology, holography etc, with information technology portends a quantum jump in information transfer [38]. Already in less than a decade, a service industry that was based on relatively short telegraph messages and person-to-person telephone calls has been transformed into a data pipeline that is carrying more and more information. The new technology of communications makes possible a flow of digital data that bursts over electronic circuits from computer to computer, streaks through the air between microwave relay stations and is bounced off satellites from continent to continent. Imperceptably, perhaps, the new capabilities arising from the fusion of these technologies reshape our perception of society. The emerging information environment is characterised by:

1. Exponential increase in volume of information flow.
2. Time and distance no longer being constraints upon communication.
3. Global shrinkage (of time and distance)
4. Decrease in 'time cushion' between socio-technical changes, their impact and consequences.
5. Increase in dependence upon information and communications services.
6. Growth of complexly linked systems for basic societal services.
7. Increased interdependence of previously autonomous institutions and services due to feed back required for common information.
8. Abrupt changes in perception of socio-physical environment.
9. Radical conceptual changes induced by increased information and communication.

Conscious use of an elaborate scheme of symbolism (information processing) in his interpersonal and inter-environmental transactions has not only provided man with a survival mechanism and dominance role, but has secured cohesion and reality of human society. In an increasing measure the information processes are being externalized and built into hardware tool systems, which perform various types of information processing for man, at greater speeds, with greater precision, handling vast amounts of information.

The value of the uniquely human operation (thinking) at a computational level has changed by a factor of 10 in the past two decades. Developments in programming such as preprogramming of mathematics and other functions into the computer for routine use is a significant development. The rapid increase in the growth and interlinkage of large computer networks and their control capabilities also represent a significant change, not only in magnitude, but in the qualitatively pervasive impact on human society -- as it begins to rely more and more on cybernetic control systems for myriad routine production, service and maintenance functions. "Rather than machines dominating man, however, this growing interdependence begins to resemble his other symbiotic relations with the natural environs. It is, in effect, a new symbiosis". Time needed for accessibility and processing of information would be considerably reduced in the future as indicated in the illustrative examples mentioned below:

2 Impact of Education

The impact of advances in communication, computer and information technologies hold promise of improving educational facility, and its quality, reducing its cost, and making it more widely and conveniently available. Educational facility is likely to move out into research centres, service centres, communication centres and other off-campus locations including industrial organisations, thanks to the newer information transfer devices, such as television casettes, audiovisual media, computer data banks, etc. This implies a one-time capital expenditure than on expensive teaching tools/faculty. While the new input/output devices would interconnect and bring closer together people of similar interests located in different departments and centres, it may result in less communication, because a large part of the faculty time may have to be devoted to the preparation of audiovisual and other materials for use in the system.

Traditional methods of transmitting knowledge and information through books, blackboards, face-to-face lectures is likely to be replaced by electronic classrooms, automated network linked libraries, and computer-supported pupil oriented instruction. These advances coupled with the automation of copying facilities will accelerate document delivery system. Networking of library and data centres would facilitate access to specialised data files -- demographic, economic and scientific data

As a result of improved services and with people attaining skill in using information technology, the demand patterns are likely to change and consequently the very nature of education may have to change. This will have considerable impact on the management of education.

3 Impact on the Medical Field

The impact of the developments in communication and information technologies in the medical field may be summarised as follows :

(1) Computer-assisted collection and retrieval of medical data; (2) Utilisation of computers in clinical chemistry; (3) Computer prediction of the outcome of reconstruction surgery; (4) Computer support of medical decisions in ambulatory care; (5) Computer-based diaries for the assessment of subjective symptomatology; (6) Augmentation of the decision-making capabilities of physicians; (7) Development of interactive information systems, clinical information systems, ward management information systems, patient data bank, etc.

The remote access possibilities at global distances would facilitate the quick access to specialist consultants. The systems would be designed for online interactive mode with the practitioner in the field closely in mind, and with the capability for using natural language, facility for error compensation, video display, etc.

4 Impact on Business and Management

Forecasts on the future of computer-based management information systems indicate: (1) A shift of concentration away from hardware and clerical automation to improved systems design for managerial use; (2) Acceleration in the speed of real-time processing for management planning and business applications The manager of the future will be able to make decisions based on real-time access to data banks and library of easily retrieved programs and mathematical models; (3) Time-sharing developments necessitating the reorganisation of multidivisional companies; (4) Dedicated services and special data processing bureau for use of the customer; and (5) In general, vast improvements in Management Information Service, but the critical factors would be the manner in which the equipment and software and supporting services are used.

The improved Management Information Service, would provide a wider range of choice for the management and the movement from one area of operations to another (diversification), will be easier and entail a lesser degree of risk. Availability of relevant information would reduce the time-lag between the identification of problems and finding solutions to them. The quality of staff functions would be improved with greater certainty of productive and gainful results. The management will also be able to draw upon and interact with experts and widely dispersed groups in real-time tele-conferencing mode.

5 Impact on Society

The acceleration of the pace of life (eg. speed-up of production through automation) means that every minute of 'down time' costs more in lost output than ever before. Delay is increasingly costly. Information must flow faster than ever before. At the same time, rapid change by increasing the number of novel, unexpected problems, increases the amount of information needed to cope with those problems. This combined demand for more information at faster speeds is cracking the rigid vertical hierarchies of a typical bureaucracy

New knowledge either extends or outmodes the old. In either case, it compels those for whom it is relevant to reorganize their store of images. It forces them to re-learn today what they thought they new yesterday. Robert Hilliard, a broadcasting specialist for the US Federal Communications Commission, comments: "At the rate at which knowledge is growing, by the time the child born today graduates from college, the amount of knowledge in the world would be four times as great. By the time the same child is fifty years old, it will be thirty-two times as great, and 97 per cent of everything known in the world will have been learned since the time he was born". The tremendous expansion of knowledge implies that on the average, each book contains progressively a smaller fraction of all that is known.

Max Weber points out that the remarkable increase in the speed by which public announcements as well as economic and political facts are transmitted exerts a steady and sharp pressure in the direction of speeding up the tempo of administrative action. Information surges through society rapidly, drastic changes in technology come fast that newer forms of organization that would be instantly responsive, are needed.

In the information-rich and technologically fast developing world of tomorrow the pace and direction of social change is likely to be set and guided by those individuals, institutions, and nations having the capabilities for optimal use of information in making gainful decisions in all areas of human endeavour [47].

6 Impact on the Individual

The emerging information environment may prove to be a turbulent one, with shortened lapse time between developments and changes. Many an individual may find it difficult to adapt and adjust if he is not prepared. The positive and negative impacts may occur concurrently or disparately on different individuals. Some of the anticipated impacts are as follows:

Positive Impact. -

1 Extension of sensory ranges through technological developments

2 Increase in higher personalised information and communication exchange.

3 Enhancement of the capability and more frequent inter-personal inter-group dialogues and conferencing through sophisticated media.

4 Better accessibility to a larger proportion of people to available knowledge.

5 Ability to use information process to:
  (a) Become more aware and more self-conscious;
  (b) Make more free and voluntary choices;
  (c) Incorporate more variety into social process; and
  (d) Avoid avoidable hardships and costs and expenses through simulation, i.e. social experimentation can be carried out without being tried on people.

6 Individuals may be enabled to play their roles in their peculiar ways.

7 Provide for and encourage personal growth.

8 Higher levels of knowing, caring and achieving self-determination.

Negative Impact:-

1 Information overload.

2 Invasion of privacy of various forms.

3 Adverse manipulation of means and media to control news and mould opinion

4 Increased surveillance and monitoring of personal data

5 Decrease in social cohesion with greater fragmentation of attitude and motivation.

6 Increased discrimination via inequable access to advanced skills necessary to use information and communications effectively.

7 Information available in quantitative terms may be given exaggerated significance as easier to incorporate into technology.

8 Collapse of time in information process may burden human adaptation.

9 Illusion of certainty may supress values of voluntary action, eg, displacement of responsibility from man to machine.

Toffler comments [48]:

> "We are witnessing an historic process that will inevitably change man's psyche. For across the aboard from cosmetics to cosmology, from Twiggy-type trivia to the triumphant facts of technology, our inner images of reality, responding to the acceleration of change inside ourselves, are becoming short-

> lived, more temporary. We are creating and using up ideas at a faster and faster pace. Knowledge, like people, places, things, and organizational forms, is becoming disposable".

7 Leisure Time and Information Services

"Taxes may tower, workmanship grow shoddy, goods inferior, prices outragenous, politics more corrupt, but the one thing that we fear most is boredom. We cannot stand time on our hands. Yet we demand shorter work hours and more time to be bored, an unwholesome cycle wherein senses have replaced the soul". This is an extract from a talk attributed to Sententius Galbo, an olive merchant, to his wife, Cornelia in 462 A D in Rome [49].

The engagement of the individual in worthwhile pursuits, particularly when his time is not used in activities germane to his personal and social interests, has been a concern of various social agencies including libraries and information services, for centuries. This concern is looming larger and larger as the individual finds more and more time, leisure time, on hand, to be occupied. History tells us that the introduction of machinery during the first Industrial Revolution, led to more production, fewer working hours, and more leisure time for the workers; and that the libraries rose to the occasion by providing the workers with such reading material as would help them learn while they earned, to develop their knowledge of and adjust their skills to the productive use of the machines and of their own leisure time.

Today the 'leisure industry' is geared to providing the individual almost all kinds of experiences he desires. Yet the book, the information services, and communication media have an important role to direct the individual's attention and interests on socially and personally ethical pursuits without at the same time restricting his freedom of choice. The design of information services and knowledge transfer mechanisms optimally suited to this purpose, is an important issue.

VIII BARRIERS TO COMMUNICATION: TEMPORAL DIMENSIONS AND SOCIAL CONSEQUENCES

1 Information and Goal Achievement

In designing information systems a basic premise is that economic, social, and political systems will perform better and more efficiently if a mechanism be provided to ensure that decision-making points have timely access to relevant, reliable, and adequate information. Therefore, obstacles to convenient access to information and absorption of ideas, for example, barriers to communication, can lead to temporal delay in the achievement of social goals. In this section, some of the constraints to communication and their socio-cultural implications, particularly at the international level, are briefly considered.

2 Influencing Factors

Communication of ideas, the basic behavioural act of man, has helped to accelerate change in almost every sphere of activity designed to satisfy his wants of one kind or the other In fact, the technological achievements since World War II have been so dramatic that people have been able to share the hope that they need no more go hungry, ill-clad, or unsheltered due to ignorance -- that is, inaccessibility or delay in the access to knowledge and the means of its utilization. Yet it is apparent that vast numbers of people are living close to misery, fear, tension, and conflict. Programmes for the sharing of the affluence and misery between the haves and havenots have, in many a case, failed to produce the desired result. Here again, inadequate information, delayed information, misunderstanding of information, or misuse of information, have been among the principal causes of the failure.

Attributes of the social system. - The attributes of the social system as a whole that may influence the effectiveness and speed of transfer of ideas and, therefore, of culture among people, include the following:

1 Whether the situation involves one-to-one, or one-to-many, or many-to-one, or many-to-many communication.

2 Whether the communication takes place within the national boundaries or across national boundaries

3 Whether the transfer of culture is attempte among equals or non-equals. For example, between economically advanced and economically less advanced countries; or between an information-rich country and an information poor country; or between a governing country and the governed country; or among a group of economically more or less equally developed countries; or among politically equally powerful countries; or among less developed countries with more or less the same GNP level.

4 The total scientific, social, political, and economic environment during the period of transfer of culture.

5 The total scientific, social political, and economic environment of the past in which the participants in the transfer process have been respectively placed, and the expected change in these factors as a result of the communication and transfer and exchange of ideas.

6 The noise, the garbage, the resistance, and the adaptability characteristics of the infrastructure already present in the recipient social system.

Attributes of Communicator and Communicatee- The attributes of the communicator and communicatee (participants) that may affect the communication process and the transfer of culture include the following:

1 The objectives and motivations of the participants involved.

2 The degree of difference in the religious, educational, economic, social and cultural background among the participants.

3 The intimacy of contact between the participants.

4 The prior experiences of the participants in similar contextual situations.

5 The degree of difference in the information richness between the participants.

Attributes of Medium and Mode of Communication. - The attributes of the medium and mode of communication that may affect the idea transfer process include the following:

1 Whether the communication is directly between any two of the participants or whether an intermediary is involved.

2 If an intermediary is involved, then whether it is an individual, an institution, or a machine system.

3 If it is a human intermediary then some of the attributes of the communicator/communicatee mentioned in section 55 are applicable to the intermediary.

4 If it is a machine system intermediary, then the particular characteristics of the machine system used.

5 Ability of the participants to use effectively the intermediary -- whether human or machine -- to achieve their respective objectives.

6 Tools and techniques of communication: Verbal, non-verbal, language (natural and code) used, recording medium, etc.

Taxonomy of objectives and Communication Across Cultures: Time parameter. - In a scientific inquiry of an object (a system, a phenomenon, or an artefact in general) the usual question to which an answer is sought is 'What is it?' This is a question of identification. This generic question is paraphrased or divided into several questions such as the following:

- What are its interesting attributes?
- What is it for? How does it serve our needs?
- How did it arise?
- What is it made of?
- How does it work?
- Where did or does it occur?
- When did or does it occur?
- How long did or does it last?
- Which time-slice is of particular interest

Time associated questions

The answers to these questions are expected to increase the inquirer's understanding of the object under study. These parameters are also used in developing a taxonomy or classification of objects and to organize information about the objects. Such a taxonomy and organization of information are deemed to assist effective communication with those who seek information about the object. However, one needs to be aware of the different cultural contexts, framework, or paradigms in which the objects might have been originally studied and the framework that the enquirer may be using. And this difference can affect cross-cultural communication. For instance, in most of the modern information classification systems "time" is used as a parameter for categorization, together with all the relevant and related qualitative and quantitative expressions of time, eg, past, present, future, early, late, two o'clock, 1975, Gregorian calendar, etc. But there are cultures whose concept of time may be in complete variance with this sort of conception. For example, some of the Amerindian cultures (Navajo, Pueblo, Sioux), some of the South Sea Island cultures, some of the Latin American cultures. The question is often raised how compatibility can be achieved between two different taxonomies of time such that cross cultural communication of information can be made effective.

The 'silent language of time' used in different cultures in different ways to communicate a person's or a group's reactions to environmental situations has been eloquently and analytically dealt with by E T Hall [50].

Particular taxonomies arise according to needs. For example, in some of the South Sea Island communities all the seven colours with which we are familar are not recognized, for they do not need all of them for the conduct of their daily activities. It is also known that as some of the community members became 'modernized' and shifted to another cultural context, their communication repertoire absorbed additional colour concepts and vocabulary.

The following list gives an overview of the "barriers to communication"[51] which adds a temporal dimension to communication of and access to, information.

Language

- Man-Man
- Man-Machine

- Jargon
  - Neologysm
  - Synonym
  - Acronym
- Presentation
  - Level
  - Style
- Media problems
  - Comprehension difficulty
  - Perception difficulty
  - Aliennes to reality
  - Misunderstanding
  - Misinterpretation
  - Differential role perception
- Culture
- Over population
  - Primary papers
  - Rehash
  - Abstracts, digests, extracts etc
- Pollution (Noise)
  - Propaganda
  - Redundant data
  - Error
- Information handling delay
  - Publication
  - Translation
  - Processing
  - Searching and accessing
  - Document delivery
  - Feedback
- Economics of information system
  - Direct cost
  - Overheads

Therefore, attempts to introduce a new idea or an innovation without a proper understanding of these socio-cultural and psychological characteristics of the target group, and also the attributes of the communication system can not only delay socio-economic change in the desired direction, but the cure may even prove to be worse than the disease. Two decades ago, Margaret Mead [52] warned:

> "... how destructive contact has been in the past between technologically developed and technologically less developed cultures, how often the price of progress has been to turn proud aristocratic nomads into pitifully limited factory workers shorn of their own tradition and provided with no new values. What is the cost of technological change in terms of the human spirit? How much destruction of old values, disintegration of personality, alienation of parents from children, of husbands from wives, of students from teachers, of neighbour from neighbour, of the spirit of man from the faith and style of his traditional culture must there be? How slow must we go? How fast can we go?"

IX FUTURE

1 Role of Tomorrow's Information Worker

The new information technologies resulting from the fusion of computer and communication technology were mentioned in Section VIII.

The machines with properties of superior perception, computation and retention faculties will grow to be partners in progress in human endeavour. They are already more precise and "knowledgeable" than the frail human beings they interface with. This takes us then to the role of tomorrow's information worker. There are, perhaps, essentially two functions which the human users of the responsive machines might perform better than they could now:

1 Conceptualization, that is, the design of patterns correlating many separate data in a meaningful way; and

2 Imagination, which implies the possibility to break through known patterns and devise new possibilities.

Therefore, man would be indispensable, inspite of the technological advances, since his mind can visualise relationships which transcend the rational or what is considered rational at present, and also because he would be able to conceive alternative methods or systems based on different attitudes, surmises and objectives.

Jungk[53] suggests the following five important future roles for information worker:

(a) The first important role of the information worker would be his linking function as a Generalist inspite of the tremendous amount of information produced. This would imply the development of horizontalists (as opposed to verticalists) who would carry out two kinds of synthesis -- synthesis within one discipline and inter-disciplinary synthesis. As a result more and more review articles would be published by libraries and information centres.

(b) Secondly, the information worker should be a Pop designer (Profile of Public designer). He should profile the different kinds of ideas coming from the public so that the decision-makers could see what the needs and desires of public are. This would imply that the public would be much better informed and educated than they are at

present, and also that the information worker would create the motivation for learning in the public.

(c) Thirdly, the information worker should be a Sniffer for information. There is considerable work being carried out in laboratories, and information on it often diffuses too late. So there is a need for observers who might build up an intelligence network of ongoing developments.

(d) Fourthly, the information worker should be a Mixer and Modeller of information. This would facilitate creation of models which would enable us to develop more complex concepts.

(e) Fifthly, the information worker should be a Gate-opener. The information worker will have access to more and more proprietary information which would be required by the state as well as the industry. Therefore, there is a need for keeping as many information channels as possible open. The information worker, as a gate opener, will have to work diligently, strongly and even dangerously against the growing tendency to close up information, to own information and not let other people have it. This is exceedingly important as the future will be influenced not only by technological, but even moral change, which might imply new responsibilities to mankind as a whole, transcending order, and more parochial loyalties of today. These future roles of the information worker would become essential in order to prevent further alienation and disaffection of modern man, which stems from the deepening ruptures between the individual and his world caused by technology and its shattering impact.

In various ways these roles of the information workers of tomorrow highlight their participation in and contribution to alongwith other agencies, the "education for survival" of humanity as a whole.

2 Some Research Issues

In an increasing measure, it is being realised that peace and prosperity in the world requires the creation of a new international economic and social order — something different from the order that obtains now marked by dichotomies, distinctions and discriminations, of haves and havenots, rich and poor, advantaged and disadvantaged, privileged and underprivileged, developed and underdeveloped. The creation of this new economic and social order depends on the cooperative and collaborative action among nations institutions of all kinds, and different social groups, so as to bring about the appropriate changes in attitudes of people as well as in social structures in the hope that it would lead to a reduction in the gap between cultures, between nations, and between social groups. Knowledge is the principal instrument of social and economic change, and the sharing of knowledge could be an effective means of reducing and bridging the gaps - spatial, temporal, cultural — in and between societies. The capability for knowledge transfer and information handling is both the potential for change as well as the indicator of achievement in material wealth. As the Club of Rome second report puts it: "All contemporary experience points to the reality of an emerging world system in the widest sense which demands that all actions on major issues anywhere in the world be taken in a global context and with full consideration of multidisciplinary aspects. Moreover, due to the extended dynamics of the World system and the magnitude of current and future change, such actions have to be anticipatory so that adequate remedies can become operational before the crises evolve to their full scope and force. If actions are to be anticipatory and effective, they must be based on a supply of information which is as complete and accurate as it can be made to be." The emerging trends in the information field — for example the new economics of information based on the concept of information as the major non-depleting resource of society, the profound mutual impact of society and information, the shifts in the loci of decision making and exercise of power — would these lead to the new economic and social order the United Nations hope for? Or, will the changes merely create a shift in the balance of power, new cultures, and precipitate new disparities in society? It is prophesied that everybody will benefit from the coming change propelled by increased access to information; it is a non-zero sum game. Will the reduction of gaps in society lead to a uniformisation and averaging out? Or, will there be adequate scope for the development of the individual, his personality and creative ability? Will the creativity be achieved through better use of the "grey cells" of the human brain - use of a larger proportion and for a longer period of time of the individual's life-span? Will this be accomplished by genetic engineering, or by an alternative technology, such as transcendental meditation? Will these be alternatives or complementary technologies useful in different contexts? The increased creativity, will it result in less or more use of information per individual on the average?

Whether the kind of society that will emerge say in the next twenty-five years would be the most desirable kind remains to be seen. In any case, in the coming decades a good part of the world's efforts will be directed towards devising means and methods of quicker access to and use of a larger volume of information at all levels. Will the developing countries benefit from these efforts? Should they use the same technologies that are now being developed in the technologically advanced countries? Or, should they look for complementary and alternative methods to achieve the goals they set for themselves?

Given the fact that whereas the totality of production, storage, organization, distribution, and utilization of information is a long range and expensive business, but that information is the basis of gainful decisions, planning, and control at all levels of human activity, there are several questions the correct answers to which could provide the elements for formulating an objective and integrated information policy. Such questions include the following:

--What are the criteria and guiding principles for apportioning national resources to information activities on the one hand and other sectors -- science, technology, economic, political, and cultural activities -- on the other?

--What are the returns and the social cost of the investment on information and how are these to be measured and evaluated? What are the criteria, means and methods for the purpose?

--How do we judge and allocate resources for the production, processing and distribution of transient but, perhaps, immediately useful data (eg. commercial information) vis a vis the more permanent information but which gives a deferred return, such as educational materials, scholarly works, and the classics?

--Is there a difference in the degree of urgency and accuracy of information needed in different areas of activity -- eg, information for business decisions and information for research?

--What is the trade off between search and utilization of existing information and the production and utilization of the needed information?

--How would one place differential weightage on different modes of information transfer -- eg, documentation services, education, mass media, etc. ?

--In the interest of maximal benefit to society, how do we distribute the controls over the existing stock and the new flows of information science several participants may be involved in the whole process -- the generator, the recorder, the collector, the distributor, etc.

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ECONOMICS OF PERIODICALS IN SPECIAL LIBRARIES: AN APPLICATION OF BRADFORD'S DISTRIBUTION TO CFTRI LIBRARY PERIODICALS HOLDING

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Rationalisation of periodical holdings based on a cost effectiveness study is necessary. B.C. Brookes has developed a mathematical model based on Bradford's distribution phenomenon for cost effectiveness studies. This paper reports one such study of the periodical holdings of the CFTRI library. An estimate of the resulting savings in the periodicals budget is made. The findings are: (i) The top 20 most productive periodicals account for 45% of the total periodical literature output in the field of interest to CFTRI, (ii) the scatter of periodical literature in this area obeys the Bradford's distribution, (iii) a flexible decision making model regarding the coverage of periodical literature can be developed

INTRODUCTION

The number of periodicals subscribed to by a library is not, by any means, an indicator of its effectiveness or efficiency. This statement is particularly true of a special library as its users seek information in only a narrow specific area. It is also generally accepted that special libraries buy more scientific periodicals than their readers would ever hope to read or scan. To some extent, it may be conceded that, this has been necessitated by the scatter of relevant papers in a particular subject among different periodicals. Nevertheless, it should be possible for the special libraries to save substantial sum, involving foreign exchange, without any sacrifice in their service to users.

Any attempt to provide a decision making model for special libraries regarding periodicals must necessarly begin with the famous Bradford's law of scattering. The two major components of Bradford's distribution are:

a) The idea that periodicals in a special subject field should be ranked in the order of their decreasing productivity.

b) A technique for developing a decision making model on the basis of the ranking.

Many workers in the field of library/information science have concentrated on developing such models which are of help to special librarians in deciding which periodicals to subscribe. B.C. Brookes has developed a model which, it is claimed, can result in substantial savings to a special Library. Based on this model, a study of the cost effectiveness of periodical holding of the Central Food Technological Research Institute (C.F.T.R.I.) libary was made.

1 THE C.F.T.R.I. AND ITS LIBRARY

The C.F.T.R.I., Mysore was established in 1950 to carry out research in Food Technology, a field which is of particular relevance to the country's needs and requirements. The library started functioning even at the planning stage of the Institute and has, over the years, built a sizeable collection of manographs, back volumes of periodicals and other documents required for carrying out effective research. In the years that followed, the parent organization considerably expanded its research activities by establishing new divisions. The library responded by expanding its acquisition programme to include new periodicals and other documents. The library has now been designated as the Food Science and Technology Information Service (FOSTIS), with the additional responsibility of catering to the information needs of the country as a whole in Food Science and Technology.

As in any special library, the bulk of the C.F.T.R.I. library's collection is in the form of periodical holdings. At present the library is getting more than six hundred periodicals of which the majority are foreign periodicals. Majority of them are being obtained through subscribtion while some are acquired on exchange and gratis basis. The break-up of current periodicals presently acquired by the library is as given below:

Mode of acquisition	Indian	Foreign
Subscription	52	164
Exchange	--	57
Gratis	16	26

Total number of current periodicals is 315. This figure refers to the total number of periodicals covered in the Documentation list.

It could be gathered that the bulk of subscriptions is to foreign periodicals. While there can be no questions regarding the usefulness of these periodicals, it is desirable to see if there could be a more economical and equally efficient (if not more) way of procuring the relevant information contained in these periodicals. No such study has been carried out so far and it is the intention of the authors to make such a study.

2 METHOD OF COLLECTING DATA

The C.F.T.R.I. library has been regularly bringing out certain information services for the use of its clientele. These include a Library bulletin, Documentation list, and Food Technology abstracts. The library bulletin, since 1976, has been merely a list of new additions to the library (excluding periodical articles). The Documentation list is a classified list of periodical articles contained in some selected journals received by the C.F.T.R.I. Library and considered to be relevant to the information needs of the Institution. For this purpose a panel of scanners regularly scan the contents pages of newly received periodicals and mark items for inclusion in the Documentation list. Some of these papers in the core journals are subsequently reported even in the Food Technology abstracts.

For the purposes of the present study it was decided to cover papers which appeared during 1975 and were reported in the 'Documentation List' and 'Library Bulletin'. This had to be so for the reason that it provided the most recent and the best representative period for arriving at any useful conclusions. It was also necessary to select a year in which practically all the issues would have been published. All the issues of the 'Documentation List' from Jan 1975 to date and all the issues of the 'Library Bulletin' for 1975 were scanned thoroughly and the number of relevant papers for each journal covered in the 'Documentation List' and the 'Library Bulletin' was tabulated.

3 ANALYSIS OF THE DATA

For analysing the data and arriving at a set of useful findings Brookes has provided two methods, namely, Numerical Method and Graphical Method. The investigators used both the methods to check if the findings tally.

31 Numerical Method

The principle is that if the cost of getting photocopies of all the relevent papers produced by a journal is less than the journal subscribtion, then it is economical to buy the photocopies than subscribing to the journals. Based on this Principle, Brookes [1] has provided a simple formula,

When $\frac{A}{P} = r$, Where A = Average annual subscribtion/periodical

P = Average cost/photocopy in the subject

subscription to journals which produce less than 'r' relevant papers per annum could be discontinued.

In the present investigation 'A' was calculated taking into account the total amount of subscription to periodicals selected for inclusion in the Documentation list, the cost of maintenance (staff + binding) and the amount spent on postage in sending reminders etc. However, Indian periodicals were not considered for calculating the average cost, since subscribtion to them were comparatively low. Thus 'A' was calculated and was found to be = 786.

The average cost of photocopies (P) was got by taking into account the total expenditure on photocopies and the number of photocopies obtained. Thus 'P' was calculated and found to be = 17 (Approx.)

$$\text{Now } \frac{A}{P} = r = \frac{786}{17} = 46 \quad \text{(Approx.)}$$

This means that, it would be more economical to buy photocopies (of relevant papers) than to subscribe to periodicals which contain less than 46 relevant papers per annum. This should not be interpreted to include review periodicals like CRC critical reviews in Food & Technology.

For arriving at conclusions regarding the number of periodicals to which subscription is to be continued, the periodicals were first arranged in the order of decreasing productivity, by the number of relevant papers they produced in the period of study (see Appendex 1). It was found that only 17 periodicals of the 315 produced 46 or more relevant papers per annum. However to be on the safer side, it would be better to include periodicals coming very near the cut off line of 46, in otherwords, it would be reasonable to include periodicals which produce atleast 40 relevant papers per annum. Regarding the rest, getting photocpies of the relevant articles would be more economical. However, this does not apply to periodicals coming under the category of 'exchange' and 'gratis' as they do not involve much financial liabalities. Also, subscription to Indian periodicals could be continued irrespective of their productivity, as they cost comparatively very little to the Library. In order words, as the acquisition of journals through 'exchange' and 'gratis' and also Indian periodicals, does not significantly affect the economics of periodicals, they need not be discontinued. The savings that would result from stopping subcribtions to these foreign periodicals coming beyond the 'cut off' line and instead getting photocopies of relevant papers produced by them is estimated as follows:

$$\text{Savings} = \begin{array}{l}\text{Present Ex-}\\\text{penditure on}\\\text{Foreign}\\\text{Journals}\end{array} - \left[\begin{array}{l}\text{Expenditure}\\\text{on periodi-}\\\text{cals to which}\\\text{subscription is}\\\text{recommended}\end{array} + \begin{array}{l}\text{Expendi-}\\\text{ture on}\\\text{Photocopies}\\\text{of relevant}\\\text{papers pro-}\\\text{duced by the}\\\text{periodicals}\\\text{for which}\\\text{subscrip-}\\\text{tion is to}\\\text{be conti-}\\\text{nued.}\end{array}\right]$$

$= (1,10,900) - (28069+17,000)$

$=$ Rs. 63,081

GRAPHICAL METHOD:

Brookes has also provided a graphical method of estimating the savings resulting from buying photocopies of relevant papers in periodicals not recommended for subscription.

A graph of cumulated sum of relevant papers vs. rank position was plotted with the latter variable on a log scale to facilitate the modelling process, on a 3 cycle semi-logarithmic graph paper (Bibliograph) The plotting was continued till a straight line appeared. The straight line was projected backwards to meet the rank axis at 'S'. Another point T was marked on the rank axis corresponding to 20. The cumulative sum of relevant papers corresponding to 'P', R(P), was calculated. The total number of periodicals in the subject concerned which produce atleast one relevant paper per annum was obtained according to the formula,

$$N = \frac{R(P) \times OT}{3 \times SM}$$

Where the ratio $\frac{OT}{3}$ is simply a scaling factor, (based on the fact that $\text{Log}_e\ 20 \approx 3.00$) which avoids the need to consult a table of natural logarithms.
In the present study,

$$N = \frac{1250 \times 108}{3 \times 64} = 703 \text{ (Approx.)}$$

This means that there are 703 periodicals which produce atleast one paper per annum relevant to C.F.T.R.I. As only 315 periodicals, included in the Documentation list, are considered for the purposes of the present investigation, the value of 'N' would be 315 under local circumstances. However, the point 'B' on the graph corresponding to the calculated value of 'N' marks the end of the 'Complete bibliograph'. The point 'A' on the graph relates to the 'complete Bibliograph' as covered by the C.F.T.R.I. In other words the point 'A' marks the end of the bibliographical coverage of the C.F.T.R.I. periodical holdings.

An estimate of the total number of periodicals which produce 'r' (i.e. 40 in this case) or more relevant papers per annum is made by calculating the numerical value of $\frac{N}{r}$. The numerical value of $\frac{N}{r}$ was found to be $\frac{730}{40} = 18$ (Approx.). This means that it would be economical to continue subscription to these 18 periodicals and subscription to the rest could be discontinued. However to be on the safe side the 'cut off' line could be extended upto 20 periodicals. The relevant papers produced by the rest could be economically bought as photocopies.

3.21 Estimation of Savings

Brookes also provides a mathematical formula for estimating the savings resulting from the adoption of the above decision making model. The formula suggested by him is:

$$\text{The total estimated savings} = NA - \frac{NA}{r} - P\left\{R(N) - R\left(\frac{N}{r}\right)\right\}.$$

Where, N = The total No. of Journals which produce atleast one paper relevant to C.F.T.R.I., per annum.

A = The average cost per periodical in the field.

P = The average cost per photocopy in the area.

$r = \frac{A}{P}$ = Threshold productivity for a periodical to qualify itself for subscription continuance.

However it may be necessary to make certain modifications in the above formula in order to arrive at helpful conclusions under the local circumstances.

$\frac{N}{r}$, the number of most productive journals in a particular area, during a specified period of time, remains constant and does not vary with the institution under study. Accordingly, $R(\frac{N}{r})$, the total number of relevant papers produced by $\frac{N}{r}$ journals does not vary. The value of N, although does not vary in a particular field, needs to be modified with the local Institution of study in view. Although these could be 703 periodicals producing atleast one or m more papers per annum relevant to C.F.T.R.I., the Institution under study is getting only 315 of these journals. Hence to estimate the savings with the value of N as 703 would lead to an inaccurate estimation as far as the Institution under study is concerned. Thus the total number of journals included in this study is to be taken as the value of N, to arrive at reasonable findings. Accordingly $R(N)$, the total number of relevant papers produced by N periodicals is to be taken as the papers produced by the journals coming under this study. If these modifications are introduced and the total estimation of savings is calculated, It will be found to be equivalent to,

$$= 1{,}10{,}900 - \{(786 \times 20 + 17x)(3475-1575)]$$

$$= \text{Rs. } 62{,}880.$$

The percentage savings would be ≈56%.

4 FINDINGS & CONCLUSION

1 The analysis of the data collected in this study clearly establishes the fact that a special library buys more periodicals than its readers could read and hence there could be substantial savings in its budget for periodicals with little sacrifice in its service. The library can provide for scanning of current journal literature by subscribing to secondary services like 'Current contents'.

2 Even if the C.F.T.R.I. Library subscribes to the first 20 journals in the ranked list, they would still be covering 45% of the complete bibliograph. This means that the remaining two hundred and ninty five journals now obtained by the library together contribute 55% of the bibliograph as covered by the library.

3 The last three hundred fifty and odd journals in the Bibliograph (not bought by the C.F.T.R.I. Library) together cover only 12.5% of the complete bibliograph (i.e., the total periodical literature output in the areas of interest to C.F. T.R.I.)

4 The first 160 journals in the bibliograph contribute as much as 75% of the total journal literature output of interest to C.F.T.R.I.

5 This study also reveals the fact that the savings estimated by absolute Numerical Method tallies with that estimated by the graphical method.

6 The scattering of journal literature obeys Broadford's distribution.

7 The 'Ranked list' of journals and the 'Bibliograph' can be used as useful decision making model regarding journal subscription. Given a statement of objectives to cover a required percentage of Literature, the 'Ranked List' and the 'Bibliograph' can be effectively used in decision making.

ACKNOWLEDGMENT :

The authors are indebted to Sri S.V. Sangameswarn, Head, FOSTIS, and his staff for their valuable assistance in this work.

[1] BROOKES (BC) : Photocopies V. Periodicals; cost effectiveness in the special library. J. Doc. 26; 1970, 22-9.

APPENDIX - I - RANKED LIST OF PERIODICALS

RANK	TITLE OF THE PERIODICAL	TOTAL NO. OF RELEVANT PAPERS
1.	Journal of Food Science	261
2.	Journal of Agricultural & Food Chemistry	156
3.	Applied microbology	115
4.	Journal of Science of Food and Agriculture	104
5.	Cereal Chemistry	100
6.	Journal of Food Science and Technology	85
7.	Journal of Milk and Food Technology	82
8.	Journal of Nutrition	75
9.	Journal of AOAC	72
10.	Biochemica et Biophysica Acta	71
11.	Journal of Food Technology	64
12.	Bie Nahrung	63
13.	Nutritional Reports International	59
14.	Biochemical Journal	58
15.	American Journal of Clinical Nutrition	57
16.	Die Starke	56
17.	Journal of Biological Chemistry	52
18.	Journal of Insect Physiology	45
19.	Die Lebursmittel Industrie	42
20.	1. Journal of Dairy Science 2. Pesticide Biochemistry and physiology	38
21.	1. Pesticide Science 2. Food Technology in Australia	36
22.	1. Archives of Biochemistry and Biophysics 2. Prooceedings of the Nutritional Society	35

23.	1. Cereal Foods World 2. Indian Journal of Nutritional Dietics	33
24.	1. Journal of Economic Entomology 2. Journal of General Microbology	32
25.	1. Food Technology 2. Process Engineering	31
26.	1. European Journal of Biochemistry	30
27.	1. Food and Cosmetic Toxicology 2. Indian Food Packer	28
28.	Biochemistry	27
29.	1. Food Science Technology 2. Proceedings of the soceity or Experimental Biology & Medicine	26
30.	Poultry Science	25
31.	1. Analytical Biochemistry 2. Canadian Journal of Microbology 3. Journal of Invertibrate pathology	24
32.	1. Journal of Texture Studies 2. Metabolism-Chinical & Experimental 3. Industrie Alimentarie	23
33.	1. Journal of Texture St	
33.	1. Fette Seifin Austri Chemittel 2. Insect Biochemistry 3. Journal of Animal Science 4. Chemical Engineering	22
34.	1. Chemistry and Industry 2. Hortscience 3. Journal of Applied Bacteriology 4. Journal of Bacteriology 5. Pest Control 6. Journal of Chromotography	21
35.	1. Gertrude Mehl und Brot 2. International Journal of Biochemistry 3. Nutrition and Metabolism	20
36.	1. Deistsche Lebensmittel Rundschan 2. Biotechnology and Bio Engineering	19
37.	1. Agricultural and Biological Chemistry 2. Bakers Digest 3. Indian Journal of Biochemistry and Biochysica 4. Packaging	18
38.	Prumsul Protravin	17
39.	1. Biochemistry and Biophysics Res Communications 2. Chemical and Engineering News 3. Manufacturing Congectioner 4. Science Reporter	16
40.	1. Australian Journal of Dairy Technology 2. Bulletin of Japanese Society for Scientific Fisheries 3. Indian Journal of Horticulture	15
41.	1. Canadian Journal of Biochemistry 2. Environmental Physiology & Biochemistry 3. Indian Journal of Experimental Biology 4. Journal of American Society for Horticultural Science 5. Process Biochemistry 6. Toxicology 7. Industries Alimentaries et Agricoles	14
42.	Fisheries Technology 2. Fruits 3. Phillipine Journal of Science 4. Journal of American Oil Chemists' Society	13
43.	1. Canadian Entomologist 2. Chemical Age of India 3. Indian Journal of Microbiology 4. Nutritional Reviews 5. Phytochemistry 6. World Agriculture 7. Critical Reviews in Food Technology 8. Journal of Dairy Research	12
44.	1. British Journal of Nutrition 2. Canadian Journal of Biochemistry 3. Austrilian Journal of Chemistry 4. Ernachrungsforschung 5. Indian Journal of Technology 6. Journal of Biochemistry 7. Chemical Technology 8. American Journal of Enology & Viticulture 9. Technical Quarterly 10. Qualitias Plants - Plant foods for human nutrition	11
45.	1. Chemical Engineering Progress 2. Current Science 3. International Journal for Vitamin & Nutritional Research	

4. Journal of the Fisheries Research Board of Canada
5. Journal of Society for Dairy Technology 10
6. Newzealand Journal of Dairy Technology
7. Research and Industry
8. Journal of American Dietic Association
9. Journal of Stored products Research

46. 1. Brewers Digest
2. Experientia
3. Hoppesye, Zast. Fuer Physiologische Chemie 9
4. Indian Miller
5. Journal of Institution of Brewing
6. Journal of Scientific and Industrial Research
7. Life Sciences
8. Nature
9. Prace-Instituteowy Laboraoty

47. 1. Indian Pediatrics
2. International Bottler and Packer
3. Journal of General and Applied Microbiology
4. Journal of Horticultural Science
5. Paperboard Packaging 8
6. Journal of the American Chemical Society
7. Oleagineu
8. Modern Packaging

48. 1. Analyst
2. Archivos Latino Americanos De Nutrition
3. Chemie Engeneering Technic
4. Food Engineering
5. International Fruits World
6. International Pest Control 7
7. Journal of Nutritional Science & Vitaminology
8. Lab Practice
9. Nutrition Reviews
10. Two and a Bud
11. European Journal of Applied Microobiology
12. Packaging Review
13. Review de Agrog Technol Alimentos
14. Operations Research Quarterly

49. 1. Baroda Journal of Nutrition
2. Bulletin of Entomological Research
3. European Plastics News
4. Follis Macrobiologica
5. Journal of Flour and Animal Feed Milling
6. Journal of Neurochemistry
7. Package Engineering 6
8. Plant Physiology
9. Research Management
10. FEBS Letters
11. New Scientist
12. Food Manufacture

50. 1. Biochemical Society Transaetions
2. Chemical Technology
3. Husipar
4. Indian Spices
5. I.S.I. Bulletin
6. Journal of Medical Microbiology 5
7. Mushroom Journal
8. Mysore Journal of Agricultural Sciences
9. Science and culture
10. Science Reporter
11. Clinica Chemica Acta

51. 1. Annals of Applied Biology
2. Food in Canada
3. Food Technology in Newzwaland
4. Indian Poultry Gazette
5. Minerva
6. Molecular and Cellular Biochemistry
7. Netherland Milk and Dairy Journal
8. Indian Veternary Journal
9. Nutrition
10. Physiologica Plantarum 4
11. Quick Frozen foods
12. Cajanus
13. International Flavours and Food Additives
14. Brewers/Distiller Bottler
15. Operations Research
16. Carbohydrate Research
17. Food Irradiation Information
18. Industrial Conserve

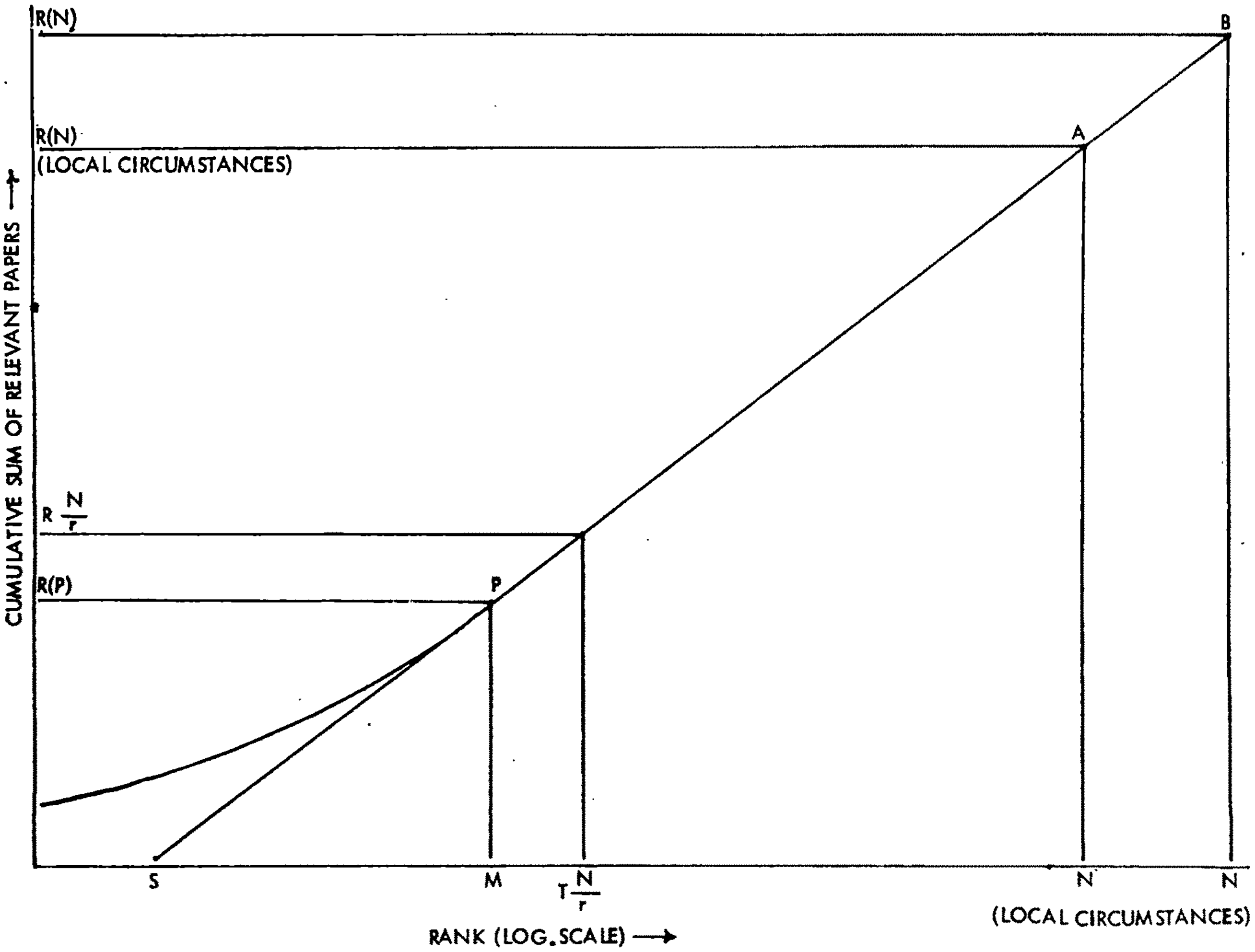
52. 1. Australian Journal of Plant Physiology
2. British Poultry Science
3. Chemical Age
4. Bakers Digest
5. Entamologica Explatis et Applicata
6. Madras Agricultural Journal
7. Peanut Science 3
8. Propsyl Bulletin
9. Varfoeda
10. Milk Industry
11. Comparative Biochemistry and Biophysics
12. Tropical Science
13. Qualitias Plantanum et materia veg

53. 1. Agriculture and Agro Industries Journal
2. Bacteriological Reviews

3. Chemical Week
4. Indian Journal of Medical Science
5. Indian Journal of Pathology & Bacteriology
6. Indian Journal of Pediatrics
7. International Bio-deterioration Bulletin
8. Journal of Cell Biology 2
9. Tappi
10. IFST Proceedings
11. Journal of Nuclear and Agricultural Biology
12. INFOR Journal
13. Industrial and Engineering Chemistry-Process Design and Development
14. Journal of Microbiology and Serology
15. Scientific World
16. Appropriate Technology

54. 1. Agricultural Situation in India
2. American Scientist
3. Annals of Botany
4. Australian Journal of Agricultural Research
5. Bio-science
6. Cafe Cacao
7. Canadian Journal of Botany
8. Canadian Journal of Zoology
9. Canner Packer
10. C.S.I.R.O. Food Research Quarterly
11. Defence Science Journal
12. Experimental Cell Research
13. Fishing News International
14. Flavour Industry
15. Food Research Institution Studies
16. Indian Cashew Journal
17. Indian Farming
18. Indian Horticulture
19. Indian Society for Nuclear Technology in Agriculture and Biology
20. Irish Journal of Agricultural Research
21. JARQ
22. Journal of Applied Chemistry & Biotechnology
23. Journal of Experimental Botany
24. Packaging Review
25. Phillipine Journal of Science
26. Poultry Guide
27. Proceedings of the Nutritional Society of India
28. Punjab Horticultural Journal
29. Seafood Export Journal
30. Swedish Journal of Agriculture Research
31. Tin and its uses
32. Tropical Agriculture
33. Agricultural Engineering
34. Planters Chronicle
35. Food Trade Review
36. Voeding
37. Research Management
38. Plastics World
39. ASTM Standard News
40. Journal of Nutritional Education
41. Boletin De la Officisana Sanitaria Pan Americana
42. Bottler and Packer
43. Reischstoffe Aromen Corpor Mittel
44. Starch
45. Scientific American
46. Internationale Zai Erna Forsch.
47. Bulletin of the International Institute of Refregeration
48. Environmental Child Health
49. Leather Science
50. Indian Sugar

'BIBLIOGRAPH'



CATALOGUING OF CORPORATE SERIALS

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Cataloguing of serials, brought out by corporate bodies, has been a difficult problem. Traces the development of the various practices through the main catalogue codes. The AACR of 1967 has not been able to solve the problem to the satisfaction of all concerned.

INTRODUCTION

Cataloguing of serial publications remains a puzzle to many librarians. All the cataloguing codes published so far provide different rules. No two codes are similar. However, when studied historically, some codes seem to have influenced others. Here, an attempt has been made to trace the historical development of cataloguing of Curporate Serial Publications— beginning with Pamizzi's famous 91 Rules to Anglo-American Cataloguing Rules 1967, and to assess the merits of various systems.

To begin with, there is a great difference of opinion as to the correct definition of the term "Serial". In Great Britain, for example "Periodical" is the term usually used for serial publications. There have been many attempts to provide exact definition of the terms "Serial" and "Periodical". Some authorities, notably Charles Ammi Cutter and S.R. Ranganathan, have attempted, to differentiate between the two terms. As it seems fairly certain that no one person will be able to convince every body that he has provided the best definition of either or both the terms, it seems futile to argue about them. For the purpose of this paper the term "Serial" is used, rightly or wrongly, as the blanket term to include Journal, Memoirs, Official organ, Periodical, Proceedings, Reports, Transactions, Yearbooks, and all such publications which are issued on a continuing basis. What constitutes a Corporate serial has not yet been clearly defined.

TWO TYPES OF SERIALS

Broadly speaking serial publications may be divided into the following two major groups!

1. Serials without an author, and
2. Serials with an author, either personal or corporate.

Considering the great number of codes in use there are relatively few points of disagreement among them in regard to basic principles. As regards serials without an author, there seems to be general agreement among all the codes to enter them under their titles, although they may not always agree on which part of the title a serial may be entered and under which title it should be entered i.e., Earliest Title, Latest Title, or Successive Title.

Serials having a personal author are almost in all the codes prescribed to be entered under the author. But the serials issued by corporate bodies, namely societies, institutes, and government agencies etc. are a problem. There is no agreement among various codes as to how they should be entered – whether under the name of the corporate body, or under the place, or form heading or title. For such serials, a study has been made for the choice of entry in the different codes.

PANIZZI'S 91 RULES [1]

Panizzi provides rules 80-83 for the treatment of various types of serial publications. According to these rules serials are to be entered under the subject heading or the form heading. Thus, for the publications of the academies, institutes, universities, and learned societies, etc, Rule 80 allows entry under the subject heading "ACADAMIES". Almanacs and calenders, etc. are to be entered under the subject heading "EPHEMERIDES"; vide Rule 82. In his Rule 83, Panizzi provides for cross references from the name of publications under which they are generally known to the main entries of such works. In these rules one finds an attempt to arrive at a main entry which is at the same time a subject entry and still not depart from the authority of the title page. It may be mentioned here, that Panizzi made these rules for the use of the British Museum Catalogue of Printed Books.

JEWETT'S CODE [2]

In 1850, Charles C. Jewett prepared a code for the catalogue of the Smithsonian Institution. He made no use of subject headings for main entry.

For serials published by corporate bodies he prescribed in Rule 22, that they may be entered under the name of the body. He established "U.S." as heading for publications of the U.S. Government. He thus improved upon the Panizzi's Rules which latter proved to be significant and pertinent to the development of cataloguing codes.

CUTTER'S RULES FOR DICTIONARY CATALOG [4]

Charles Ammi Cutter in his "Rules for Dictionary Catalog" supported the principles of Jewett on which he has been at variance with Panizzi. Cutter made no use of subject headings (except in case of anonymous biographies) for main entry. He has treated the corporate serials as follows. "The Memoirs, Proceedings, Transactions of a Society are periodicals in point of (1) occasional publication, (2) indefinite continuance, and so far as they contain anything beyond the record of the society's meetings of (3) variety of subject; but the lack of the (4) characteristic, variety of authorship, in as much as the memoirs or other papers given in addition to 'proceedings' proper may be considered as the work of the society acting through its members; the society, therefore, is the author, and the transactions etc. etc., need not have title entry. There are, however, some "Journals" published by or "under the auspices of" societies which are really periodicals, and should be so treated in entry, the society being not the author but the editor". [5]. Cutter himself was so confused about them that in his note under Rule 60, "Societies are author of their journal..." he states "Where to enter societies is the most difficult problem in cataloguing. So difficult that the Germans evade it, not entering them at all, and British Museum solves it by putting them in a separate catalog" [6]. It may, however, be mentioned that Cutter was the first librarian who attempted to set forth the catalog rules in a systematic way. His rules are often referred to as the first principles of cataloguing. In the preface to his fourth edition Cutter states "The convenience of the public is always to be set before the ease of the cataloger, as the underlying principle for cataloguing " [7].

PRUSSIAN INSTRUCTION [8]

The Prussian Instructions are widely followed in Germany and these differ to a great extent from the practices in other countries as no entry is allowed under the corporate body. The Prussian Instructions differ from other codes on the plea that the authorship can be only a personal thing, and hence they did not in general treat the names of organizations as potential main entry. Since 1931 there has been a move to revise these Instructions. However, not much progress has been made in connection with the corporate entry. One suggestion which is put forward in the German Democratic Republic is that the "the names of government bodies, societies, and institutions which occur on the title page of an annonymous work will be given an added entry when the publication relates contents-wise to the institution concerned"[9]. This is more in line with the practice in other parts of the world.

CATALOGUE RULES, 1908 [10]

These rules are the product of the joint venture of the American Library Association and the Library Association (UK). Here serials have been treated in Rules 121-125 and 128. The Library of Congress practice is also given in these rules, the British practice wherever it differs is also indicated. For Corporate Serials these rules provide that "A regular periodical issued by a society or an institution is ordinarily to be entered under its title, especially if this is distinctive in character". What is a distinctive title is not made clear. The rules become more confusing by adding "When however, the successive parts appear at long intervals-annually, bienially, etc. or when the publication, contains, only the regular proceedings, transactions, and annual reports of the society, it is to be entered under the name of the latter, with added entry or reference under the title if it is distinctive... In doubtful cases entry under the society is to be preferred" [11].

Cutter in his rules had left it to the choice of the cataloguer to enter such doubtful serials either under the title or under the name of the society with a warning to make all the necessary references. It appears that the compilers of 1908 Rules were influenced by Jewett, who had stated in his code that "The rules for cataloguing must be stringent, and should meet, as far as possible, all difficulties of detail. Nothing as far as can be avoided, should be left to the individual taste or judgement of the cataloguer " [12]. As 1908 Rules attempted to provide separate rules to cover specific situation the problem became much wider than when cataloguers were posed with problems for which no rules existed.

ALA CATALOGUING RULES, 1949 [13]

In the years that followed, the libraries often had to formulate their own rules to meet specific demands created by the volume, variety and vagaries of the publications. For corporate serials they mainly relied for guidance on the "Guide to the cataloguing of the serial publications of societies and institutions", issued by the Library of Congress and by following the practice adopted by that library in their printed cards. This guide was quite detailed and gave solutions to all problems of serials as they existed and the treatment they received at the Library of Congress. Provision for the cataloguing of Corporate Serials in the ALA 1949 code were entirely based on the above mentioned guide. Rules provide that seials published by corporate bodies and having a distinctive title should be entered under the title, otherwise under the name of the corporate body. What is distinctive title is not explained. As a matter of fact there is nothing new in the 1949 Rules.

Rule 5 in the ALA 1949 Code provides for entries of collections and serials. It follows the pattern of 1908 Rules but is more detailed, and is full of illustrations after the rules. Thus making it more difficult for the cataloguer to catalogue a work which is different from those illustrated, or not provided in the rules.

VATICAN RULES [14]

These rules were compiled at the time when the ALA 1908 Rules were being criticised in the United States and their revision was underway. These rules were the product of the joint efforts of the librarians from the United States and Vatican. As such Vatican Rules have all the influence of American practice. Vatican Rules were first published in 1930. Its Rules 229-241 provide for entry of serial publications. For corporate serials these rules provide entry under the latest name of the corporate body. These rules are, however, more detailed than the ALA Rules of 1908 or even 1949.

CLASSIFIED CATALOGUE CODE (CCC) [15]

This code is the personal contribution of S.R. Ranganathan and is widely followed in Indian libraries. Its first edition was brought out in 1934 and has since been revised five times. Its fifth edition appeared in 1964. CCC is full of detailed definitions. At FC 32 corporate body is defined as an author when "the responsibility for the thought and expression constituting the work resting solely on it or any organ of it, and not on the private capacity of any person or persons forming part of or holding office in or in any other way connected with that body". In chapter GC the distinction between the personal and the corporate authors is discussed, and in chapter GD different kinds of corporate authors are defined. The detailed definitions make the CCC more difficult to use than simplify the situation. It has even distinguished Periodical from a Serial vide FF 111 and FF 112

In CCC Main Entry is under the Class Number. So like Panizzi, CCC avoids the direct entry under the title. However, heading of the Main Entry constists of 'title proper' which can be compared with the Prussian Instructions. For Corporate Serials it is stated at FB 94, that "Title proper of Periodical Publication - includes the name of the sponsor if it occurs at the beginning and excludes it if it occurs at the end". Thus CCC solves the issue of corporate serials by leaving it to the authority of the printed title. For those who approach Corporate Serials by the Corporate body, CCC provides at PB 34 added entries "by interchanging the name of the sponsor and the Title of the Periodical Publication, and... Every variation got by substituting every Alternative Name of the Sponsor in the Heading..." It also provides an added entry under the Generic Class which CCC calls "Generic Class Index Entry", with the Heading "Periodical" or "Serial", as the case may be. An optional added entry is also provided under the geographic place name vide PB 38.

Apparently, CCC has been influenced by all the earlier codes and tries to cover all aspects by providing added entries to cover different angles from which a serial publication may be approached i.e. subject, title, corporate body, place of origin, etc.

CODE REVISION

Beginning from Panizzi's 91 Rules to ALA 1949 Rules, cataloguing codes not only increased in number but also made the problem more complex. No code for example took into consideration economics of cataloguing or practical needs of the reader. Osborn, in his paper, "The crisis in cataloguing", said that "More and more rules and definitions are being worked out constantly until at the present time it begins to appear that the classicism is taking full control" [16]. He pleaded for simple rules and suggested that the revision of the cataloguing rules should be based on pragmatic theory.

In 1949, the Library of Congress also published their rules for descriptive cataloguing. These rules were simple and became successfull. All these led to the demand for simplification of rules for author and title entry. As a result, the Board on Cataloguing Policy and Research of the American Library Association's Division of Cataloguing and Classification asked the Library of Congress to make a detailed study of the ALA Rules for Author and Title Entry. In 1951 the task was assigned to Mr. Seymour Lubetzky, Library of Congress consultant on Bibliographic and Cataloguing Policy. Lubetzky worked on this task for two years and in May 1952, he issued the first draft of his report. This report was revised after it was studied by leading contemporary librarians and cataloguers. Second draft was issued in March 1953. Again, after criticism and suggestions from leading authorities a third draft was issued in 1953 under the title "Cataloguing Rules and Principles". Here, Lubetzky questioned the very structure of the ALA 1949 code and suggested few principles on which new code may be formulated. These principles later became the basis for the new Anglo-American Cataloguing Rules, 1967.

Before the final Rules were published in 1967, two draft codes were prepared by Lubetzky one in 1958 and another in 1960. These were discussed in Stanford Institute and the McGill Institute respectively.

PARIS PRINCIPLES:

Two international conferences were held in 1959 and 1961 on principles of cataloguing. At the end of the 1961 Conference "Statement of Principles" was adopted which are now popularly known as the Paris Principles. For Corporate Serials, Paris Principles provides as under:

9 Entry under Corporate Bodies.

9.1 The main entry for a work should be made under the name of a corporate body (i.e. any institution, organized body or assembly for persons known by a corporate or collective name.)

9.11 When the work is by its nature necessarily the expression of the collective thought or activity of the corporate body; even if signed by a person in the capacity of an officer or servant of the corporate body, or

9.12 When the wording of the title or title-page, taken in conjunction with the nature of the work, clearly implies that the corporate body is collectively responsible for the content of the work.

1. e.g. official reports, rules and regulations, manifestoes, programmes and records of the results of collective work.

2. e.g. serials whose title consist of a generic term (Bulletins, Transactions, etc.) preceded or followed by the name of a corporate body, and which include some account of the activities of the body [18] and,

11.23 Works whose main entry to make under the name of corporate body but which have districtive titles not including the name of the corporate body [19]. The 1967 Anglo-American code is mainly based on these principles, with slight variations especially with regard to corporate sinids.

ANGLO-AMERICAN RULE, 1967 [20]

Its Rule 6 deals with serial publications and divides them mainly into the following three groups:

A - Serials without any author, personal or corporate should be entered under title. To distinguish between two similar titles rules provide that place of publication may be added in parentheses after the title. If both the titles appear from same place then dates of commencement and ceasation may be added after the place name

B - Serials issued by the corporate bodies have been divided in two parts:

1. Those which may be entered under title e.g. "a Periodical, monographic series, or a serially published bibliography, index, directory, biographical dictionary, almanac or year-book issued by or under the authority of a corporate body," except when it includes "the name or the abbreviation of the name of the corporate body or consists solely of a generic term...."

2. Any other serial not provided above but issued under the authority of corporate body may be entered under the body.

C. Serials issued by a personal author may be entered under his name.

The compilers of this code have departed from the Paris Principle No. 9.12 as regards corporate serials are concerned on the plea " that the inclusion in the title of a serial of the name or part of the name of the issuing corporate body is too powerful a criterion to be nullified when, in unusual cases, no account of the activities of the body is included in the publication. Further, "Known primarily or conventionally by title" is too vague a criterion.

The British edition of the A.A. Rules [22] for cataloging corporate serials differ substantially from the North-American text. Several serials issued by corporate bodies are entered under the corporate body but some or not. The British version decides the issue by studying the relationship between the title of the serial and the name of the issuing body.

Present code like ALA Rules is inconsistent in allowing entry of some serials issued by a corporate body under the title and some under the name of the corporate body. So the problem is still with us.

CONCLUDING REMARKS

An age-old problem relating to corporate publications is the entry for the writings of officers of corporate bodies. All codes except Prussian Instructions, provide some entry under a corporate body. In Germany where Prussian Instructions are followed, librarians have now agreed in principle to the entry of a corporate authorship. Cutter entered them under the name of the body because he considered them as authors and as a convenience to the readers it will bring all publications of a corporate body together in the catalog. The 1908 Rules, created more confusion by differentiating between distinctive and non-distinctive titles. In 1949, rules became increasingly elaborate and intricate. Lubetsky approached this problem from a different angle, i.e. authority. He allowed entry of a serial publication under title "a serial is entered under the title not because it is a serial but because it is subject to change of author. In fact, if there is no change of author, a serial is entered under the author" - e.g. corporate body [23].

Mr. Chaplin, while commenting on the problem at Paris Conference said that there are two approaches to entry under corporate bodies: (1) theoretical; and (2) useful, and in case of official reports of a corporate body there is no difference [24]. He further pointed out that it was necessary to make distinction between serial publications - such as the periodical reports of the activities of a corporate body for which the body was completely responsible, and periodical publications made up of separate contributions by individual personal authors, there was also intermediate type of publications which contained individual contributions but which was still an official record of the proceedings of the corporate body [25]. Prof. Lubetzky has clarified the position by stating that the corporate body may be considered not only as the editor of a periodical but also as the compiler... A corporate body could act as the compiler either of one work or of a publication in serial form; its relationship to both types of publication would be the same.. If a serial was not subject to changes of authorship, it should be entered under its author" [26]

Anglo-American Catalog Rules, 1967 provide that for serials published by corporate body entry may be made under the corporate body only... if the title (exclusive of the subtitle) includes the name or the abbreviation of the name of the corporate body, or consists solely of a generic term that requires the name of the body for adequate identification of the serial, "[27]. Otherwise it should be entered under the title, with an added entry under the corporate body. In 1967 the age-old problem is still unsolved.

It is difficult to convince everybody that a given method in the best. Since the 1967 Code has fallen short of the expectations the need for a code which is simple and economical to use still remains. No wonder the 1967 code is already under revision and the new code is expected to be published in 1977, which hopefully may solve the riddle.

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FOCUS ON UNISIST PROGRAMMES

UNESCO GENERAL INFORMATION PROGRAMME RESOLUTION OF THE GENERAL CONFERENCE

The General Conference of Unesco, at its 19th session, which took place last November in Nairobi, adopted a resolution concerning amongst others the future development of the UNISIST programme.

According to the proposals made by the Director-General, the Conference agreed to set up a General Information Programme covering the activities of the organization in the field of scientific and technical information and of documentation, libraries and archives.

The Conference approved the Statutes of the Intergovernmental Council for the General Information Programme and instructed it, among others, to ensure the continuity and the development of actions undertaken in the context of the UNISIST programme recommending the appropriate use of its name in the future. This Council shall carry out its functions with regard to the Intergovernmental UNISIST Programme, in conformity with the provisions made in Article 4 of the Statutes of the UNISIST Steering Committee, (approved by the General Conference at its 17th session) that Committee being superseded by this Council.

The 19th General Conference recognized the significant results achieved so far by the UNISIST programme and the value of its general contribution to the development and inter-connexion of information systems, and instructed the Director-General to take the necessary measure to ensure that the General Information Programme, particularly through the development of projects begun under the UNISIST programme, provides a conceptual framework for the information systems devised by the agencies of the United Nations and for Unesco's information activities as a whole.

BANGKOK SEMINAR ON USER TRAINING (14-14 OCTOBER 1976)

Strengthening information infrastructure is presently a major preoccupation of the various countries in Asia and Oceania. The education and training of present and potential users of scientific and technological information in the better utilization of information services offered to them is seen as part of this preoccupation. And rightfully so, for the ultimate object of information systems and services are the users.

Following the 4th General Assembly and Congress of FID/CAO held in Bangkok from 10 to 13 October, a two-day regional seminar took place. The "UNISIST Seminar on training users of scientific and technical information: Analysis and evaluation of UNISIST Guidelines" was attended by over 100 participants from 15 countries. It was organized by Unesco in collaboration with the Thai National Documentation Centre (TNDC), Applied Scientific Research Corporation of Thailand (ASRCT), with the assistance of FID/CAO. Dr. Wadanyu Na Thalang, Governor of ASRCT opened the seminar, Mr. T.S. Rajagopalan of INSDOC, India was selected as Chairman and Miss D.E. Torrijos of NSDB, Philippines, was selected as Rapporteur.

The seminar devoted itself mainly to user training experiences in various countries in the region, a review of the UNISIST Guide for user training and its applicability to the regional conditions, and a discussion of problems related to user education and training and of strategies for a more effective utilization of existing information services and sources.

Papers presented for discussion included: The User Training Issue (by J. Tocatlian, Unesco); User Training - The missing link between users and resources (by R.B. Palmer, Barnard College Library, Colombia University); Means and Methods of Training Users - the UNISIST Guide (by A. Evans, Loughborough University, U.K.); User Training in Australia (by P.J. Judge, CSIRO, Australia); Using the UNISIST Guide for conducting workshops (by L. Pringgoadisurjo, PDIN, Indonesia; Doo-Hong Kim, KORSTIC, Republic of Korea; T.S. Rajagopalan, INSDOC, India); Implementation of some UNISIST projects in Asia (by J. Valls, AIT); The

REGIONAL INFORMATION NETWORK PROJECT FOR SOUTH EAST ASIA (BY D. TORRIJOS, PHILIPPINES).

Reactions from the participants were heard and sollicited for a fruitful sharing of experience. Existing and planned programmes for training users were described by participants from several countries, such as Japan, Malaysia and the Philippines, and the organizations present, such as the UN Asian Development Institute, the AIBA/SEARCA, and AIT.

ROME SEMINAR ON USER TRAINING (18-21 OCTOBER 1976)

Following the Bangkok meeting, which was essentially regional in character, the "UNISIST Seminar on the education and training of users of scientific and technological information" was held in Rome. It was of international character; all geographical regions being represented. The objective was to provide an international exchange of experience on the problem faced in planning and implementing training and education programmes for users of scientific and technological information, to obtain a broad overview of the issue, to catalyse international co-operation, and to advise Unesco on a long-term programme for user training.

The seminar was organized by Unesco in collaboration with the Consiglio Nazionale delle Ricerche, Laboratorio di Studii Sulla Ricerca e Sulla Documentazione and the Istituto Italo-Latino Americano (IILA). The participants chosen on the basis of their professional experience were invited in their personal capacity. There were 30 participants from 15 countries and a number of organizations, such as ESRIN, FAO, IAEA, IILA, and UNEP. Dr. P. Lazar of CTLDC, Hungary, was selected as Chairman and Prof. A. Neelameghan of DRTC, India, was selected as Rapporteur.

Following each presentation, an extensive and rich discussion produced a set of ideas which are structured in the final report.

The papers presented for discussion included the following: Measurement of information use and user needs as a basis for training programmes (T.D. Wilson, U.K.); User education in academic institutions including secondary school and university (A. Neelameghan, India); Training of users of libraries and documentation services (K. Burian, Turkey); User training in the context of a technical information service (G.P. Sweeney, Ireland); Sensitization of decision-makers, policy-makers and manager (M. Menou, France); Means and methods of training users (A. Evans, U.K.); User training as a component of national information policy (J. Gray, U.K.).

ISDS GENERAL ASSEMBLY AND GOVERNING BOARD MEETING (11-14 OCTOBER 1976)

By his circular letter of 28 June 1976 the Director-General of Unesco communicated to Member States the text of the Agreement between Unesco and the Government of the French Republic on the establishment and operation of an International Centre for the registration of serial publications within the framework of the International Serials Data System (ISDS). At the same time he invited Member States to participate in the establishment of the permanent structures of the system by attending the first General Assembly meeting and by acceding to the Statutes of the International Centre.

In accordance with the Statutes, the General Assembly was convened by the Director of the International Centre and organized at Unesco House from 11 to 12 October 1976. Delegates representing 25 Member States and observers from five non-governmental organizations attended the meeting. Mr. P. Poindron, head of the French delegation, was elected Chairman.

The main points of discussion were: (1) accession of Member States to the Statutes; (2) examination of the report of the Director of the International Centre; and (3) election of the Governing Board.

The first meeting of the ISDS Governing Board was held immediately after that of the General Assembly (13-14 October 1976). After an extensive debate on the report of the Director of the International Centre, the Board expressed its appreciation of the results already achieved. It was decided that the international register of serials should be published in microform and that the ISDS Bulletin should continue to be published in printed form. It was also decided that a short-term budget (1977-1978) should be submitted to the next meeting of the Board as well as a long-term one (1977-1982). After approval by the Board, these budgets should be communicated to all Member States.

INTERNATIONAL SYMPOSIUM ON INFORMATION SYSTEMS IN ONGOING RESEARCH IN SCIENCE - PROCEEDINGS

The Proceedings of the International Symposium on Information Systems in Ongoing Research in Science organized in October 1975 by Unesco under its UNISIST programme in collaboration with the Smithsonian Science Information Exchange (U.S.A.) have now been published by the Hungarian Central Technical Library and Documentation Centre in a volume of about 500 pages.

The Proceedings include the 46 papers submitted to the Symposium, the discussions of these papers as well as the panel discussion. All contributions are presented in their original language (i.e. English or French). Each paper is preceded by summaries both in English and French.

GUIDELINES FOR THE PRESENTATION OF PUBLISHERS' SERIES

The Guidelines for the Presentation of Publishers' Series, which have just been issued as a

UNISIST document are one of the results of the effort undertaken by the UNISIST Working Group on Primary Sources of Information. Created in 1973 with the aim of undertaking appropriate measures to harmonize the presentation of information in primary sources, this working group first identified existing guidelines or standards relevant to primary documents as well as the gaps where standardization could be initiated under UNISIST auspices.

On the basis of reviewing existing normative documents, the following categories of primary publications were recognized as requiring priority action: Transactions, proceedings and other reports of meetings; Ad hoc series such as publishers' series; Dissertations and theses.

The Working Group agreed that guidelines should be developed for these three priorities by competent institutions or persons. To ensure that the guidelines adequately reflect the needs of a broad range of users and producers of primary documents, the group proposed a monitoring scheme for the work of the contractors, with task groups consisting of three persons responsible for the supervision of the guidelines.

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BOOK REVIEWS

Functions and objects of author and title cataloguing; a contribution to cataloguing theory, by A Domanovszky. Budapest Akademiai Kiad, 1974. 174p.. ISBN 963-05-0381-6. [Reviewed by B Guha]

In any discussion of cataloguing theory, Dr. Domanovszky's views command a respect which very few can aspire to attain. His strong views and convincing logic were very much in evidence at the Paris Conference on Cataloguing Principles and contributed much to the deliberations of the Conference. Even there the brilliance of Domanovszky could be seen only in bits and spurts. The present work unfolds an integreted view of some of the basic ideas that the author holds on author-title cataloguing.

Dr. Domanovszky believes that 'author-title cataloguing... cannot do without an elaborate theoretical basis, and, that what cataloguers have achieved by now in the way of building up such a theory is in many respects still rather far from satisfactory'. This belief, which forms two premises, has prompted him to undertake the present study. The subject matter of the study is centred round two ultimate 'aims'. Firstly, an attempt has been made to improve, the present state of theory, especially, in the context of 'functions and objects of author-title cataloguing'. The second aim is to verify the two premises from which the author started the investigation.

The functions of the catalogue, in a way, form the very basis of cataloguing theory. Hence, the author goes on to investigate whether we are clear about the functions. It is shown that the 'denotation of the term [function] is still very far from being unequivally fixed'. By the term 'objects of cataloguing' the author means those objects about which information is conveyed by library catalogues, and not the objectives of catalogues. Domanovszky recognises three catalogue-functions and three denotations of the term 'object of cataloguing'. He introduces a complex idea which he calls 'objects of a function' meaning thereby those objects about which information should be conveyed within the range of a function. Each book in the library, it is held, has to be recorded in a manner suitable for serving three totally different purposes. At the same time there may exist in the same book two or more objects to be catalogued.

After providing a brief historical outline of the development of the functions of the author-title catalogue (Chap 3) the author goes on to develop his meticulous logic for formulating the three functions of the catalogue. The first function as it emerges and finally stated is "The fundamental sector of the first function consists in conveying information about all primary elemental objects, i.e., physically separate items... The complementary sector of the first function consists in conveying information optionally i) about secondary elemental objects, i.e., about intellectually separate and self-contained components ... (e.g., about the individual papers contained in the report of a symposium) or about subordinate constituents of the contents of primary elemental objects (e.g., about appendices, accompanying studies, prefaces, epilogues, commentaries... the author of all of which is not identical with the author under the name of whom the respective primary elemental object is entered); and finally, 2) about tertiary elemental objects, i.e., about specific aspects of primary or secondary demental objects (e.g., about a translatorial, editorial or reviser's performance of a person different from the author... in the production of a primary or secondary elemental object...).

The above version of the first function, even though quoted partially, appears to be quite complex. But the utility of the above statement of function can be realised when we recall that none of the statements of functions or objectives of the catalogue, made since the days of Cutter to the Paris Conference, can really cover all the cataloguing practices that we have developed. For example, none of the functions can provide a logical basis for the mentioning of the contents of a composite book in its main entry nor the preparation of analyticals. Yet, every code provides such prescriptions. The first function of the catalogue, so meticulously developed by Dr. Domanovszky, for the first time, takes care of such cataloguing practices. A good part of the study is actually devoted to the development of the first function.

Dr. Domanovszky enunciates, as mentioned earlier, two more functions of the author-title catalogue. They are very much related to the first function. In fact, they follow logically from the first function.

The study, because of its very nature, is difficult-reading. It has to be very carefully read. In fact to those for whom cataloguing means only a set of rules and their applications, this publication will hardly be of any consequence. However, the present reviewer believes that in India we have been attaching greater importance to the theoretical foundations of cataloguing compared to a number of other places. This has mainly been due to the efforts of S R Ranganathan. Hence, it can be reasonably hoped that Domanovaszky's scholarly study will be of interest to quite a few Indian interested in the theoretical foundations of cataloguing.

Cataloging phonorecrdings, problems and possibilities, by Jay E Daily. New York, Marcel Dekker, 1975. IX, 172p. (Practical library and information science ed by Jay E Daily, vol. 1). $13.75 ISBN 0-8247-6196 [Reviewed by B Guha]

Quite a few publications by the same author have come out in recent years. In the area of cataloguing the author has made significant contributions by introducing fresh ideas and new points of view. The present volume is no exception to that.

It is well known that one area in cataloguing for which the Anglo-American Cataloging Rules have been found to be woefully inadequate is the cataloguing of phonorecords. The inadequacy has been expressed in our professional literature from time to time. It has often been complained that the AACR has missed the subtle difference between printed music and its recorded performances. As a consequence phonorecordings have been treated as "just-like-books" in the AACR. This is reflected most in "its blindness to the importance of the name of the performer in the identification of a phonorecording".

According to Dr. Daily "the performer distinguishes this method of storing information from all others".

On the genesis of the present work, Dr. Daily has said that his students at the Graduate School of Library and Information Sciences, Pittsburgh, "have taught him to respect the problems of cataloguing phonorecordings enough that an explanation in detail is possible". The present work embodies those details. Dr. Daily, however, does not want to advocate a method of cataloguing through this publication. He offers it as a means of understanding what the possibilities are in phonorecord cataloguing.

The book explains clearly the essentials of the various elements that should be used to identify the contents of or the phonorecording itself. Everything that is discussed, is well supported by appropriate examples. In fact, the book provides a very good collection of examples of varieties of phonorecordings. For cataloguers some knowledge of music is said to be a definite advantage, and the author provides some basic knowledge of music and phonorecordings in the first chapter, very thoughtfully entitled 'Written on the wind'. A list of uniform titles and subject headings is also provided.

The items of information that are necessary to describe fully a phonorecording are divided into ten distinct fields. The sequence of these fields is suggested and the contents of each field are elaborated with considerable detail. This is a good way to make the students and cataloguers understand the problems involved.

Each of the ten fields that have been prescribed for a complete entry can either be searchable or unsearchable. This introduces a very useful way of thinking about the kinds of information to be included. In a computerised system, a searchable field means the computer will be able to locate specific items within the field, while an unsearchable field means the information will be produced only if other information or the complete entry is sought. While in a manual system, the searchable fields indicate what additional entries or added entries should be made.

The first three fields, which are all searchable, are: title, author or composer, and performer. Three separate chapters are devoted to these three items. The next five fields, that is four to eight, are all prescribed to be unsearchable. The nature of information to be mentioned in these fields is more for the identification of each item. Field four is to contain the names of producer or distributor; field five will have the identifying number; field six may contain physical descriptions such as speed, size, etc; field seven may take the series number; and field eight is reserved for additional description, if necessary.

The last two fields, number nine and ten, are reserved for information that will be made into entries in a manual system or that are completely searchable in a computerized system. Field nine is to have the contents, especially for a collection of works. Field ten is to record the points of access or tracings.

The work provides an excellent account of the problems of phonorecord cataloguing and suggests the most logical solutions. The prescriptions suggested can be easily fitted within the framework of any catalogue code. They are again suitable for large and smaller libraries and also manual and computerised catalogues.

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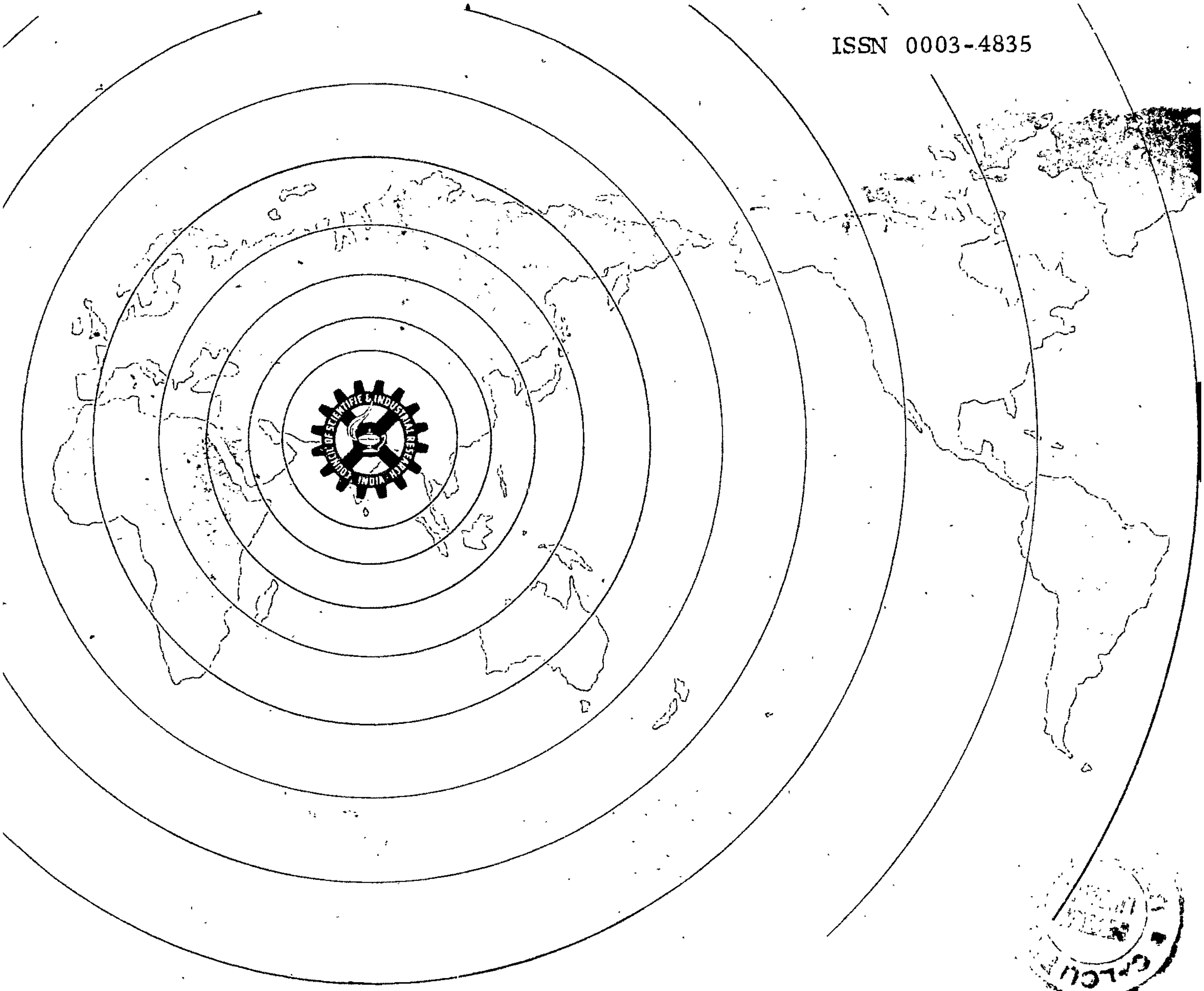

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INDUSTRIAL INFORMATION SYSTEM IN THE USSR

E Kamala Rao
INSDOC, New Delhi-110012

INTRODUCTION

Though rudiments of industrial information services in the USSR could be traced to the appearance of the first specialized information centres, the Bureaux for Scientific and Technical Information; the concept of industrial information could be comprehended only after the establishment of a number of information institutions in some of the important branches of industries during the year 1945. Further, the phenomenal growth in scientific research, industrial development, organization of the State and Collective Farms, the socialistic pattern of society and evolution of the "State System of Scientific and Technical Information" have provided great impetus to the development of the Industrial Information System.

OBJECTIVES

The Industrial Information System is intended to serve different user categories, such as management personnel, research and development scientists, production engineers, service technicians and commercial agencies. It has been planned as an integral part of research and development, design and development and production processes. It is aimed at bringing out a close cooperation between the information agencies and the users; and also at active participation of scientists and engineers in the information work. It is geared to timely provision of relevant information to all the user categories, which in turn, will contribute to the accelerated growth of scientific and technical processes, and to the betterment of the general welfare of the people.

FUNCTIONING

The Industrial Information System of the Soviet Union functions on the five different categories of information agencies of the "State System of Scientific and Technical Information" namely, the All-Union, the Central Industry oriented, the Republican, the Regional or Territorial Information Institutions and the Local Information Agencies. The functioning and the publications issued for information dissemination from some of the All-Union information institutions have been described in the previous article (Ann Lib Sci Doc 1975, 22(1), 5-11). The place, objectives, methods of functioning and the publications issued from the Central Industry Oriented, Republican, Territorial and Local information agencies are discussed here with reference to the information supply to the industries in the USSR.

CENTRAL INDUSTRY ORIENTED INFORMATION INSTITUTES

The Central Industry Oriented Information Institutions are main links between the All-Union Scientific and Technical Information Centres and the local information units. These are established under their respective ministries at the Union and Republican levels and are second level information agencies in the hierarchy of the system. They coordinate and guide the work-flow and methodology in the information flow. They are responsible for the accumulation and processing of the domestic and foreign literature; organization and maintenance of branch oriented reference-information files; development of reference information tools like 'Rubricators, coding principles, information retrieval languages' etc. in their particular branches. The stock of these institutions are composed of scientific, technical, engineering and economic literature; deposited manuscripts, patent documents, technical norms, proceedings of conferences, meetings, seminars; as well as information cards and copies of scientific and technical films in each branch. On analysing the accessions, the information publications, such as, bibliographies, abstracting booklets, survey articles, factographic compilations and recommendatory leaflets are prepared and issued periodically, for each major aspect of the industry concerned. They are not duplication of similar publications issued from the All-Union Institutions, but are complementary and extensions.

There are 82 such central industry oriented information institutions such as:

The Central Information Institute for Electrical Engineering called "Informelektro"

The Research Institute of Economics and Information in Radio-electronics,

The Research Institute of Information in Mechanical Engineering,

The Research Institute of Techno-Economic Studies for Chemical Industry,

The Central Institute of Technical and Economic Information on Light Industry,

The Central Research Institute for Instrument making,

The Central Institute of Scientific and Technical Information in the Food Industry,

The Central Institute of Information and Technico-Economic Research of the Coal Industry etc.

SERVICES AND PUBLICATIONS

Further, these institutions provide SDI services in their respective branches, to satisfy standing information needs of the enterprises, collective readers and also individuals from their data base. The concept of SDI service though originally proposed by H.P. Luhn in the USA in 1958, has been widely accepted in the USSR information circles as the most effective means of alerting users to the current literature. Since 1964, many computerized SDI systems have come into operation at some of these central information units. This service is rendered to satisfy either the long term information needs or answer specific requests. All the three types of SDI systems, namely the manual, the semi-mechanized systems which use punch card equipment and the computerized SDI systems are under operation. In each of these groups, inter-disciplinary SDI services are under operation from the regional and the territorial information establishment. The industry oriented services are functioning at local information centres. The services functioning at the local centre levels are mostly manually operated. The functioning of these services is determined by the changing needs of demands. The changes in the requests of users reflect the actual problems to be solved in scientific R&D, D&D and production areas. Further, these orders indicate the trends and tendencies in R&D.

The information cards, which are posted from the local and branch information units form an important source of ascending flow to the central information institute and are incorporated into the data files. These are prepared from the results of the current R&D projects, their phases and partial technical solutions, new production techniques, technical processes and proposals for innovation.

REPUBLICAN INFORMATION INSTITUTIONS

The Republican Institutes of Scineitifc and Technical Information and Technico-Economic Studies, 15 in the whole of the USSR, serve the information needs of the industries which are not served by the central-industry oriented information institutions or the managerial agencies of the republics. Their reference information collections are characteristic of their specific needs and reflect their industry base and agricultural potentialities. The archives of patent documents and the technical normative documents form the integral part of the general stock of these institutions. To this stock are added the information cards supplied by the local agencies. The information publications, issued from these organisations are in both the languages, the Russian and their national language. The information supplied by the All-Union institutions is, sometimes, translated and utilized for compiling these publications. The publications are also characteristic of their regional needs. For instance, the Uzbek SSR information publications are mainly devoted to the problems of cotton growing and textile industry and the publications issued from the Georgian SSR information institute are on tea and coffee cultivation and their processing.

TERRITORIAL INFORMATION CENTRES

Each of the Inter-disciplinary Territorial Centres for Scientific and Technical Information and Publicity, consists of a central scientific and technical library and publicity house. Their collections are somewhat analogous to those of republican information institutes and provide specific information services and organize propaganda work also. The "Leningrad Territorial Inter-Branch Institute of Scientific and Technical Information", being one of the largest territorial institutions, has an enquiry reference catalogue of one million cards of non-standard reference collection. Annually, about 4 million requests are being met with, from this collection. In addition to more than a million documents and periodicals, the collection of the library contains all patent specifications of the world. Standards, microfilms and unpublished R&D and D&D reports enrich the collection.

SERVICES

The Institute has a "Mechanized Information Section" which maintains the information and invention files and organizes information retrieval services. Since 1972, SDI services are organized on specific topics, like Machine Building Technology, Mining, Electrical Engineering, Metallurgy, Agricultural Practices etc. to the local clientele. "The Inter-Branch Information Department" strives to know the local demands; while doing so, gathers information on new inventions made in the enterprises. On identifying the information needs of groups of workers, SDI personal services are being provided on 35 specific topics, such as Automatic Control Systems, Welding etc. and on some narrow agricultural specializations.

PUBLICATIONS

The publications regularly issued to disseminate the collected and organized information include:

1. Information leaf-letters issued as signal information media on about 20 topics like unpatented innovations, reports etc.
2. Information sheets, which deal with the new inventions that are put into practice in that territory. The data is arranged by the UDC system in these sheets which are called as maps.
3. Lists of designs and equipment collected from the reference collections.
4. Lists of new patents.
5. Bibliographies and
6. Catalogues of educative films.

LOCAL INFORMATION UNITS

The Local Information Centres of Scientific and Technical Information are represented by departments and bureaux of scientific and technical information at large enterprises, research and development organizations, factories and collective and state farms. These are the main users of the information processed by all other information centres, from the all-union level to the territorial level, and in their turn are responsible for supplying it to all other agencies concerned with that particular field at the grass-root level. They are responsible for raising the efficiency of research and development activities, fulfilment of annual and five-year plans, and improving the professional competence of the personnel in their specific fields. The collections of these agencies are specific to their field, include books, periodicals and all the relevant reference and bibliographic tools published by the information centres at higher level. They analyse and generate desired information from their collection and actively participate in the fulfilment of the set targets. They post the organized information, generated from the active R&D work of the agencies to the central industry-oriented republican and territorial information institutions. The local information organs function through their library and technical information units. A translation cell is also attached to each of these agencies. There are about 9,000 local translation cells attached to such bureaux at different industrial enterprises and research institutes in the USSR.

The local information bureau of the "Mosrentgen Plant", a medium sized X-ray machine engineering enterprise with 15,000 workers, houses about 60,000 books, 160 journals in 20 languages and other bibliographic tools. Similarly, the information centre of the "Bolshevic Confectionery Factory" with 2,500 workers, has 2,725 volumes of books and gets only 15 periodical titles. The technical library of the 'Mascovich Automobile Plant' a big industrial enterprise with 4600 engineers and about 20,000 workers, posesses 142,000 books on all aspects of automobile engineering, and 150 periodicals. Manually operated SDI personal services are being provided to the top level engineers and technicians at these local information units. These local information units organize technical weeks, technical schools, exhibitions; publish leaflets, pamphlets and put on posters as a means of propaganda.

R&D AND UNPUBLISHED INFORMATION

In spite of the rapid growth of various information controlling tools, vast amount of research and development results fall outside the purview of the published sources. These information items are meant for limited circulation and quite a mass of R&D and D&D information goes into production process unpublished. To control such unpublished information stream, specialised information agencies have come into existence in most of the advanced countries of the world. The All-union Scientific and Technical Information Centre for R&D Projects came into existence in the year 1968 to register and stock all current and completed research and development projects, dissertations, algorithms and programmes in the USSR. The communication of unpublished information helps in avoiding the duplication of R&D work and also expedites the industrial production process.

PUBLICATIONS

1. R&D Abstracts. The accessed material is processed and the registration cards of the approved research projects are prepared. Abstracts of interim reports on successive research phases are also prepared along with those of completed projects and published.

2. Current Awareness Indexes. These are issued to publicize the registered input. All the central industrial information agencies take the responsibility of disseminating the R&D infor-

mation, after incorporating it into their data banks and files. The All-union Scientific and Technical Information Centre for R&D Projects provides reference information services to the collective as well as individual users. From this source, microfilms, microfiche document copies are supplied to the clients. Factographic, bibliographic, reviewing and analytical reference services are also rendered.

INDUSTRIAL CATALOGUES

Industrial catalogues are important special publications and indicators of industrial development, technological characteristics, like, the size of the plant, methodologies adopted in processes and many other inferable parameters. For controlling this vast inflow, specialised indexes are being used from the All-union (State) Scientific and Technical Library (GPNTB).

PUBLICATIONS

1. New Industrial Trade Catalogues Index Series: For the compilation of this series, the material is divided into various user oriented information groups, such as, Designs of Machines, Designs of Industrial Structures, Designs of Engines, Designs of Chemical Engineering Equipment and so on and catalogue indexes are issued regularly.

2. Current Reports Series: Changes made in Manufacture of Articles, Specifications of Specific Products, Catalogues of Production Processes, Trade Catalogues of Capitalistic Countries etc. are also published in this series.

3. Directories of Unexploited Processes are also published. From these sources, data sheets of equipment and any other required service is provided. The copies of the catalogues or the originals are supplied to all the institutions through the appropriate information agencies.

INDUSTRIAL INFORMATION FLOW

Industrial information is at an interface between the general information and the specific industry and its supply is linked with industrial production through successive stages of information flow between the all-union, central industry oriented and local information agencies. Information is preconditioned to different stages, namely to research and development, design and development, design assessment, project construction, direct production and to the technical report writing stages. In a given project, as all these stages proceed in a cyclic progressive succession, the information supply also reflects the same courses. The information provided at R&D and D&D stages is of academic nature and is mostly supplied from the all-union institutions of scientific and technical information. The information supplied at all the other stages is from the central industry oriented and also from the local information bureaux.

For information supply, four types of users have been recognized: the academic scientists, the members of the State Planning Committee and Ministers, the industrial management and the specialised worker force. The first group is served by the all-union institutions, the second by branch information institutions, the third exclusively by the local bureaux and the fourth category by all the information agencies. There are 13 all-union information institutions, excluding that of social sciences, more than 160 specialised republican and central institutions of scientific and technical information and about 9,000 information departments and bureaux housed in leading industrial enterprises and research organizations.

Information supply to industry is through many specialized systems, each of them originating from their central information institution and providing specific services to the group of local information bureaux and information departments of R&D institutions, D&D organizations and industrial enterprises attached to it. The "Central Information Centre of Instrument Making" has developed a specialised system called as "Referat System" which functions on MINSK-22 computer and provides information supply to all the allied industries. Monthly SDI bulletins and abstracts in 8 specific areas are supplied to permanent reader groups along with specialised reference services. Another automated information descriptor IR system has been developed by the "Central Institute of Scientific and Technical Information in Electrical Engineering" of the USSR Ministry of Electrical Engineering Industry. This system also operates on MINSK-22 computer with a data base of more than 250,000 documents. From a base of 10,000 documents in English language, another sub-system, named "Kachestvo" which obviates the translation barrier, is functioning efficiently for retrieving information through the product names, manufacturers, designers and so on. The overall reference and information collection of the various organizations and enterprises under this institute has reached a total of 20 million printed items. From this base about 300,000 industrial requests are replied in a year. The Institute has a dynamic reference collection which showed an increase of two million item entries in the last four years. Similarly, most of the central industry oriented information institutions are striving to develop their own IR subsystems. These systems have advantages of single time input, upkeep and multipurpose and multi-dimensional information generation and dissemination capacity through their publications.

DISSEMINATION CHANNELS

The information support to industry is provided through various channels of communications like publications, lectures, seminars, conferences, radio broadcasts, telecasts, cinema, etc. Of all these, documentary channels have been found to be the most effective in transforming the technological processes and advanced know-how from R&D phase to industrial production. Methods and modes of specialised document flow and the supply of information publications to industries are the important forces in accelerating industrial production. Thus the main functions of the industrial information agencies in the USSR are:

1. generating and disseminating the primary and secondary documents;
2. organizing reference information services like SDI and specific request responses; and
3. providing continuous information support to accelerate production and its improvements.

DOCUMENT FLOW

The document flow is specific and so organised to support the scientific and technical activities in an industry, from conceptual framing of technological objectives to their industrial implementation and exploitation. Thus the document support is mainly focused on:

1. devices which include machines, equipment, plan, instruments, design patterns, assemblies, etc.;
2. materials and methods, which encompass engineering procedures for processing raw materials and articles, manufacturing articles, techniques of controlling equipment; and
3. processes, like power transmission, transformation, etc.

Specialised documents are generated for each industry for different information users such as, managers, research scientists, and design, process, project and production engineers. As information being the essential component in industrial management, the managerial staff are supplied with analytical surveys which bring out trends in R&D and industrial implementation, appropriate technologies, and internal and external trade. Surveys of market trends, reports on industrial dynamism, state-of-art surveys etc. are some of the essential document sources. Suitable documents are generated and supplied to different sections engaged in industrial development. They range from designs, calculations, schematic diagrams, prototypes, features of analogous new objects. The document support given to the engineering staff of the enterprise is concentrated with the information on pre-conditions of production, manufacturing of individual parts and assemblies etc.

From this stage, continuous supply of information in the form of SDI bulletins, abstracting publications, specific query-answers, information sheets and cards which show the trends and progress in specific industry is maintained from the central and local information agencies. Information cards and sheets form the ascending flow of information from local to central information institutions. Thus, in the Soviet Union, the information agencies are so arranged to place workload of information searching on documentalists and information scientists instead of leaving it to the scientists and engineers. It is stated that this arrangement is accelerating the industrial production.

TECHNOLOGY CLUBS

Further there are 'Technology Clubs' which serve as main links between the information suppliers and the recipients. These are generally attached to the all-union and central- branch information centres. For instance, there is a club for scientific and technical information dissemination to promote standardization at the All-Union Research Institute of Scientific and Technical Information, Classification and Coding. There are 91 Technological Clubs in the USSR of which 17 are connected to coal-mining, 4 to oil extraction, 36 to railway transport, 8 to metallurgy, 7 to engineering and 19 to other industries. Besides these, there are clubs at all industrial enterprises, and technical information offices which take active part in information dissemination work. These clubs are instrumental in organizing inter- and intra-factory seminars for sharing advanced experiences. Excursions and business trips form part of the information exchange programme.

AUTOMATION OF INFORMATION PROCESSING

As early as 1959, Academician A.I. Berg had envisioned a three-tiered, pyramidal, nationwide computer network for collection and dissemination of economic information in the Soviet Union. The proposed three levels correspond to those in the scientific and technical information system, namely, the base level, the central-industrial information level and the top all-union level. The computer, Minsk-22, a small second generation versatile scientific machine was introduced in the USSR in the early sixties. Since then, Minsk-22 and Minsk-32 are being used in the all-union and the central information institutions for information control and dissemination. At the all-union institutions, the computers are generally used to bring out their current awareness publications like the signal information bibliographies and also to expedite their publications rather than for providing personal services. At VINITI, a Minsk-22 is used to expedite the publication of their "signal information" bulletins and for the control of acquisition files. An automated system on Mins-32 is in operation for controlling inter-library loans at the All-Union Scientific and Technical Library (GPNTB).

Efforts are being made to provide regular personal services, for groups as well as individuals from the central industry-oriented, republican and the territorial information institutions by using computers. Each institution adopts its own methodology for isolating and standardizing descriptors, introduces desired coding techniques, develops its own information retrieval language, organizes search strategies and retrieval techniques, suited to their computers. The 'Referat' system, an IRS on instrument making, automation and controls, is in operation for the last four years in the Central Information Institute for Instrument Making. The Central Information Institute of Light Industry has developed an IRS, called the Crystal-Leg-Rom. A large descriptor utilizing IRS entitled ".Kachestvo" is in operation at the Central Information Institute of Electrical Engineering. The 'Patent' of the All-Union Institute of Patent Information and Technico-Economic Research has acquired a third generation computer, Razdon-3 for patent searches.

AUTOMATION IN INDUSTRY

Computerized systems for information as well as for other operations, have come into operation at local or plant level, in bigger industrial establishments. An automated system is in operation with a third generation computer at the 'Moskovich Automobile Plant'. The Lvov Automated Control System is in operation at the 'Lvov Television Plant' in the Ukraine. Computer is being used for monitoring the production of nitric sub acid and for calculating the production and consumption of ammonia at the 'Severodonetsk Chemical Combine'.

From different information centres, various types of specific user services are being offered by using computers. They are:

1. SDI Service, every year a user profile is constructed and monthly information leaflets are issued;
2. retrospective search and the resulting specific bibliographic and specific query answer services;
3. preparation and publication of specialised abstracting services on specific aspects, and
4. supply of abstracts on marginal punch cards to the users as well as to the local information centres.

Effective feed-back systems have been developed to ascertain the relevance of the supplied information to the users. The Central Information Institute of Light Industry supplies an assessment scale, in terms of short descriptors, along with the desired information which is processed and retrieved by the Crystal-Leg-Rom system. On the basis of the degree of relevance, the user rates the supplied information on the scale of 1-5 points and sends it to the supplier. From this, the supplier improves the information services. Similarly, at many places, their own specific relevance scales have been developed.

All these efforts go to fulfill the plan, which is aiming at creating a network of 800 regional data processing centres of third generation computers by 1980. These data banks are supposed to contain the data on region's population, industry, agriculture transport, housing and so on.

It is proposed to improve the information system in general and industrial information supply in particular through further development of its activities at different stages, through interaction and coordination of its separate units, mechanization and automation of information collection, storage, retrieval and preparation of information publications. Attempts are made to develop a single integrated automated scientific and technical information system by coordinating different information sub-systems. A large-scale utilization of computers, small-graphic-arts and communication equipment for information processing and training of highly qualified information scientists to solve the problems of depth analysis, multidimensional correlation and synthesizing of specialised information are envisaged in future, in the scientific and technical information supply of the USSR.

CONCLUSIONS

A comprehensive centralised scientific and technical information system has advantages with respect to coverage, interdisciplinary approach; accessibility for wider sections of the users, and finances and manpower economy. When operated only with conventional methods of information processing techniques and controlling tools, the system has some drawbacks, like operational delays, bureaucratic growth, impersonal attitudes, etc. But such drawbacks can be overcome with automation and improved management methodology. For a large developing country like India, which has a huge scientific and technological, educational and research infrastructure, a centralised system of scientific and technical formation has the advantage of retaining the existing useful institutional set-ups without dislocating them much.

A centralised system is not necessarily for a limited number of organisations at a single level, but an integrated network of institutions at different levels and fields with decentralized responsibilities, dynamic information flow between coordinate and subordinate organizations appears to be quite effective for developing countries. As in the Soviet Union, a small number of computers of appropriate capacity, may fulfil the desired requirements in different areas of science and technology, research and development, policy formulations and decision making. In India, it has been proposed to integrate all information agencies into a centralized network, namely, 'The National Information System for Science and Technology' (NISSAT), in the Fifth Five Year Plan period.

The limitations of the State System of Scientific and Technical Information have been brought out by Medvedev. The delay of one to one and half years between the publication of the research article in the scientific periodical and appearance of its abstract in the Rferativnyi Zhurnal (RZ) appears to be partially due to the delay caused by centralised system. Efforts are being made to overcome this limitation to some extent, by the 'Express Information" bulletins published from most of the All-union institutions which are trying to obviate the language barrier also, by providing elaborate digest for a few very important articles published in foreign journals. Further, specialized bibliographies are issued to alert the scientists to the important articles from the most productive foreign journals. This major defect is being overcome, to some extent by enriching the local information bureaux with all the important primary journals in a specific area, SDI bulletins and personal reference services in the Soviet Union.

In spite of the massive efforts, it appeared that there is every possibility of redundance in information supply and not much of economy has been achieved either in terms of finances or man-power in the USSR, because of not discarding earlier institutions and practices, after organizing more and more new information agencies and units. However, supply of the industrial information through the nation wide, centralised scientific and technical information system, appears to be of importance to developing countries, which have limited resources for R&D and scientific and technical information.

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ACQUISITION OF PERIODICALS: AN EXPERIENCE IN SENDOC

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Discusses problems involved in the procurement of foreign periodicals. Points out that amongst all acquisition method in practice direct subscription system gives more satisfactory results. The study is based on the acquisition of about 1200 periodicals in SENDOC.

1. INTRODUCTION

Periodicals constitute an important part of a library collection. Their importance is manifold in a special library. They bring out the results of research and development within weeks of formulations, whereas it takes a very long time for them to appear in the shape of a book. Because of their worth, a huge part of a library's budget is allocated for periodicals and due care has to be taken in their selection and acquisition.

2. ACQUISITION OF PERIODICALS

The process of acquiring books and periodicals by a library is known as "acquisition". The work of acquisition involves selection, ordering and obtaining materials by means of gift, exchange or against payment.

As regards the difference between acquisition of books and periodicals, the procedures involved in their selection are almost same. The difference lies in the mode of payment and obtaining them. Since books are commercial publications, the common practice is that booksellers supply them on a credit basis and prefer bills for payments. It is also very common that booksellers leave their new arrivals in libraries on an "approval basis" and arrange book exhibitions from time to time for spot selections.

While it is common in the case of periodicals, acquisition of books directly from publishers is rare. This is advisable only for publications which the book trade fails to acquire due to low margin of profit or no profit at all. Somehow, this should be considered as the only way when there is no other means of acquisition.

The process of acquisition of a book ends once the publication is received. Contrary to this, acquisition of a periodical is a continuous process for which, besides selection difficulties, one has to pay the subscription in advance and wait patiently for the arrival of all the issues throughout the year. Missing of even a single issue from a volume may land the librarian in trouble involving him in an excessive correspondence. Hence, acquisition of periodicals demands complete alertness.

3. ACQUISITION PRACTICE

There are several methods practised in the acquisition of periodicals, out of which the principal ones are discussed hereunder:

i) Through local agents,
ii) Through foreign agents,
iii) From publishers directly,
iv) By membsership of learned societies,
v) By means of exchange, and
vi) By means of gift/complimentary.

Among the above methods, the last two do not pose any problem as their acquisition depends upon mutual agreement between two libraries. The first two, namely, subscriptions through Indian agents and foreign agents have been tried by librarians in this country for a long time and have been discarded in many cases due to the agents' wrong business deals like misuse of subscription amounts paid by the libraries. The foreign agents, such as the Blackwell's at Oxford, however, have intimated that business from this sub-continent does not remain to be a gainful affair due to increased correspondence, postage costs and abnormal claims for missing issues [3]. Moreover, the agents also claim extra service charges on non-discounted items. Here it is important to note that there is no hard-and-fast rule to point out a "short discounted" title to justify the claim of a supplier. Hence whatever is said by an agent has to be accepted in total without further arguments.

On the whole there is a strong feeling among the librarians that in the acquisition of periodicals the role of an agent has shrunk to only forwarding communications and money in foreign currencies whenever received. The supply anyhow is effected directly by the publishers.

The relation between the publishers, agents and libraries in the case of subscriptions through agents and the relations between publishers and libraries in direct subscription system are shown in the following two figures:

In view of the difficulties mentioned earlier, the only means left for a serials librarian is to go in for subscriptions directly with the publishers. This paper deals with the successful working of this system in the library of the SENDOC (Small Enterprises National Documentation Centre).

4. DIRECT SUBSCRIPTION SYSTEM

To obtain current periodicals from foreign countries no import licence is needed. Foreign exchange for subscription to current periodicals of science and technology can be drawn from the banks.

Books have also been exempted from import trade control (ITC) restrictions under certain conditions like only single copies of books should be imported at a time, they should be scientific, technical and educational, the total value of the import in a year should not exceed the limits fixed by the government and notified in the Gazette and the current ITC policy (Ministry of Commerce, Government of India, 1974). The following two paragraphs extracted from ITC policy volume I, April 74–March 75, dealing with the permissibility of import of books by individuals and organisations will make the point clear:

(i) "Any person can import technical and scienti fic books permissible for import under the Import trade control policy in force from the time of importation upto a C.I.F. value of Rs.500/- at any time for his own use".

(ii) "Technical and scientific books permissible for import under the Import trade control policy in force at the time of importation by an educational, technical and research institute or university recognised by UGC for its own use provided the C.I.F. value of such goods imported in a financial year shall not exceed 10,000 rupees and applications are made through UGC".

Much has been written and discussed about the problems of periodicals acquisition in Indian libraries but very little has been done to point out a right method of acquisition according to the present-day situation. Even the IASLIC's Lucknow Conference (1975) has failed to bring a definite suggestion to solve the problem. Some favoured the agenc system, and very few have favoured the direct subscription system. The general apathy to direct subscription system is on the plea that correspondence work and postage is increased. However, all accept the merits inherent in it. Much has been

SUBSCRIPTION THROUGH AGENT
DIALOGUE THROUGH INTERMEDIARY

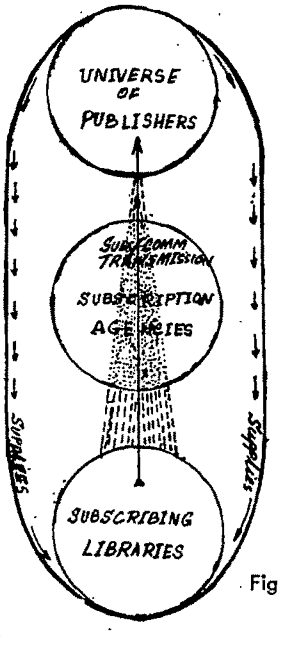

Fig. I

DIRECT SUBSCRIPTION
DIRECT DIALOGUE WITH PUBLISHERS

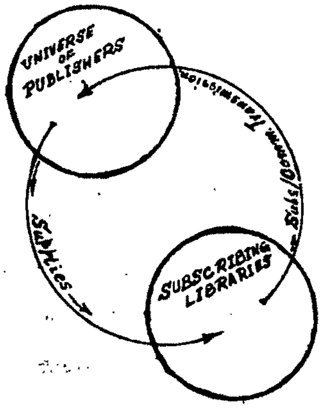

Fig. II

said about the State Trading Corporation (STC) which has yet to streamline its business on modern lines.

Though direct subscription system involves a greater correspondence work, too many invoices, too many drafts, heavy postage costs and direct dealings with banks for obtaining drafts, this is still considered advantageous for reasons like security of money paid and supply of material ordered for, especially when no other successful system is available.

The correspondence work, however, can be streamlined to a certain extent by devising suitable forms like reminders, renewal notices, payment forwarding letters etc.

5. PROCEDURES INVOLVED IN DIRECT SUBSCRIPTION SYSTEM

When it is decided that certain titles are to be added to the subscription list of a library, letters calling for an invoice for arranging payment can be issued. On receipt of a handful of invoices, letters along with form "A" duly filled in for issue of drafts in foreign currencies should be sent to the bank. These forms are obtainable from the concerned banks.

The bankers usually insist on separate form "A" for each beneficiary. That means one form "A" for each invoice needs to be prepared. To avoid this unnecessary duplication of work and waste of energy, the bankers may be convinced to accept one form "A" for the total sum of invoices in a particular currency. For example, if ten invoices in dollar currency are received, their listing showing the beneficiaries' names, addresses and the amounts for which the drafts are sought, with the total at the bottom and form "A" for that total sum should be attached with the letter addressed to the bankers for issue of drafts. The SENDOC has such an arrangement with the bankers.

When the drafts are received from the bank, they are forwarded to the concerned publishers after making payment entries in the internal recording system. Most of the publishers wish that a copy of the invoice should accompany the payment and it is always better to do so to ensure proper entering of subscriptions.

To test the efficiency of the system, the following study carried out on a few selected titles of periodicals subscribed to by SENDOC and two other libraries in Hyderabad, using three different systems, reveals the superiority of the direct system both on cost commitment and supply position.

6. PERIODICALS ACQUISITION IN SENDOC

SENDOC subscribes to 1,160 periodicals, both Indian and foreign, covering a wide field of Science and Technology, Social Sciences including Management. Besides this it receives about 20 national and state newspapers and has affiliation as an institutional member with ten national and international organisations. All subscriptions are directed to the publishers since 1972.

The steady growth of periodicals acquisition since 1971 is shown in the following table:

Year	No. of periodicals received
1971	260
1972	350
1973	450
1974	650
1975	1160

The countrywise distribution of the periodicals currently received in SENDOC is as follows:

Table: Distribution by country of periodicals in the current acquisition list

Country	No. of Periodicals
Australia	3
Austria	3
Bangladesh	2
Belgium	2
Canada	10
Chile	1
Ethiopia	5
Federal Republic of Germany	2
France	2
Ghana	5
Greece	1
Hong Kong	10
Hungary	1
India (including 19 dailies)	550
Iran	2
Italy	3
Jamaica	3
Japan	15
Kenya	8
Lebanon	1
Malawi	2
Malaysia	7
Morocco	1
Netherlands	12
Nigeria	8
Norway	1
Papua and New Guinea	1
Philippines	3
Sierra Leone	1
Singapore	5
Sri Lanka	2
Sweden	1
Switzerland	10
Tanzania (including a daily)	3
Thailand	1
UK	229
URE	1
USA	249
W. Germany	2
Zambia	4

The function of the periodicals section in a Documentation Centre is entirely different from that of an academic or research institution. In other words, its role is changing according to the requirements of the personnel in the organisation. For instance, a library attached to an academic institution records and displays the periodicals after receipt and ultimately when a volume is completed, it is got bound and shelved permanently on the stack for future reference whenever demanded. So also in a research library. After recording some libraries prefer to circulate the journals among selected readers, while some libraries only duplicate tables of contents and distribute them enabling the readers to select the articles of their choice and request issues for a short loan.

The situation is, however, different from the above in a documentation centre since its main purpose is to store the information for timely retrieval. The periodicals received here have to undergo many processes such as distribution among the staff members for preparing abstracts, typing them on cards and filing them in cabinets. The periodicals are finally shelved in their respective places.

In SENDOC, after recording, the current issues of periodicals are kept in display and the immediate previous issues are removed from display and sent to the members of the staff for scanning and preparing abstracts of pertinent articles. The periodicals are then routed through the typing pool for taking all abstracts on 3.5 cm x 10 cm catalogue cards. These cards are inter-field in the CIF (Central Information File), a data base for information storage. Finally the issues are shelved in their respective places.

Since periodicals are the main source of information to be stored and disseminated, the back issues need to be provided frequently to the readers and staff members for reference and answering queries or to furnish the photocopies. This work has been on the increase since the starting of the SENDOC Bulletin, a bi-monthly publication.

7. RENEWAL OF SUBSCRIPTIONS

Normally renewals are taken up in the month of September so that all invoices are received and paid promptly ensuring the proper supply of periodicals during the next year. In a library where a fairly good number of titles are subscribed, it will take time to issue all the renewal intimations. For convenience, the issue of letters should be broken into groups proportionately so that the arrival of invoices may also be correspondingly spaced enabling the librarian to process them without any difficulty.

Usually, foreign publishers start sending the renewal notices during the same period and for such titles renewal intimations can be avoided saving a little on postage costs.

Sometimes publishers fail to send the invoices until December. These however are rare cases. Still drafts for such titles can be purchased by submitting the renewal cards found inserted in these particular journals, or an issue of that journal itself along with the postal wrapper, if preserved. Since the bankers require only some authentic documentary evidence through which it can be ascertained that the journal is imported and the subscription amount claimed is correct, the particulars given in the above will satisfy them for the release of foreign exchange.

Sometimes drafts made in such a way are received back, if the subscription rates are enhanced and the draft made is insufficient to cover the full period of supply. These too are rare cases. For such titles, another draft for the difference of amount can be purchased by submitting the letter of the publishers through which the difference has been claimed.

Due care should be taken while sending communications and payments of subscriptions to journals for whom exclusive agents have been appointed in India. If orders for such journals are sent directly, they may be redirected to such agents thus wasting time and money. Hence care should be taken. The following are some of the publishers with their respective Indian agents:

	Publishers	Exclusive agents in India
1.	Plenum Publishing Corporation	India Book House, Bombay
2.	Marcel Dekker	-do-
3.	Academic Press Incorporated	-do-
4.	Gordon & Breach	-do-
5.	OECD & FAO	Oxford Book & Stationery Co., New Delhi
6.	McGraw-Hill Publications	Their representative at Bombay.
7.	ILO Publications	ILO, New Delhi
8.	UNESCO Publications	Orient Longman/Oxford Book & Stationery Co.

8. REMINDERS

There is hardly any library which can claim to have received all issues of periodicals subscribed to in a year. Missing of issues is bound to occur for many reasons like computer mistakes, loss in postal transit etc. which are beyond our control. An alert librarian can only undertake the challenge of "chasing" missing issues and try his best to get

COMPARATIVE STATEMENT OF COST COMMITMENT ON CERTAIN TITLES ACQUIRED IN THREE DIFFERENT LIBRARIES USING THREE DIFFERENT SYSTEMS DURING 1974

TITLE	DIRECT				**FOREIGN AGENT				LOCAL AGENT		
	Subs. Rate $/£ oths.	Equ. in Rs.	No. of Rem. sent in a year	No. of issue missing in a year	Subs. Rate $/£ oths.	Equ. in Rs.	No. of Rem. sent in a year	No. of issue missing in a year	*Subs. Rate claimed by Agent Rs.	No. of Rem. sent in a year	No. of issue missing in a year
Adm. Sc. Quarterly	$ 20.00	164.06	2	-	-	-	-	-	288.00	1	-
Am. Jrl. of Sociology	$ 16.00	131.20	2	-	$ 16.00	131.20	-	-	144.00	1	No supply
Asian Survey	$ 19.00	155.80	3	-	$ 19.00	155.80	1	-	177.00	2	-
Beh. Science	$ 19.00	155.80	2	-	$ 19.00	155.80	2	-	171.00	2	-
Br. Jrl. of Sociology	£ 5.00	94.40	-	-	£ 5.00	94.40	-	-	81.00	2	2
Data Processing	£ 9.00	169.92	1	-	-	-	-	-	172.00	1	-
Data Systems	£ 8.00	151.09	-	-	-	-	-	-	176.00	-	3
Encounter	£ 4.95	93.46	3	-	-	-	-	-	99.00	2	No supply
European Business	$ 20.00	164.06	2	-	-	-	-	-	180.00	1	No supply
Factory	$ 35.00	287.11	3	-	-	-	-	-	315.00	1	4
H. B. R.	-	153.00	-	-	-	-	-	-	162.00	3	1
Human Organisation	$ 21.00	172.20	-	-	$ 21.00	172.20	-	-	-	-	-
Human Relations	$ 40.00	328.00	1	-	£ 21.69	409.50	1	-	-	-	-
International Mgt.	£ 10.00	188.85	-	-	-	-	-	-	225.00	2	4
Jrl. of Applied Psy.	$ 25.00	205.08	1	-	$ 25.00	205.08	1	-	225.00	1	2
Jrl. of Documentation	£ 12.50	236.00	2	-	£ 12.80	241.66	1	-	-	-	-
Jrl. of Pol. Economy	$ 21.00	172.20	2	-	$ 21.00	172.20	-	-	189.00	2	-
Listener	£ 12.00	226.56	-	-	£ 13.78	260.16	2	-	-	-	-
Long Range Planning	£ 10.00	188.85	1	-	-	-	-	-	200.00	2	-
Management Accounting	£ 2.45	46.25	-	-	-	-	-	-	49.00	-	1
Management Science	$ 32.00	262.34	1	-	-	-	-	-	288.00	1	1
Occupational Psy.	£ 7.50	141.64	3	-	-	-	-	-	150.00	2	-
Operations Res. Qtly.	$ 21.00	172.19	1	-	-	-	-	-	200.00	2	-
Popular Science	$ 9.50	77.93	-	-	-	-	-	-	85.50	-	-
Rural Sociology	$ 16.00	131.20	1	-	$ 16.00	131.20	2	1	108.00	2	No supply
Sociological Absts.	$ 70.00	574.00	1	-	$100.00	820.00	1	-	-	-	-
Work Study & Mgt. Ser.	£ 8.20	151.09	-	-	-	-	-	-	164.00	2	No supply

$ @ Rs. 8.20
£ @ Rs. 18.88

**Some foreign agents now demand upto 20% handling charges

*The agent has quoted the subscription in Rs. only them replaced through the publishers or by some other means like duplicate exchange wherever such facilities prevail. The Duplicate Exchange Union formed recently by the Vikram Sarabhai Library in the Indian Institute of Management, Ahmedabad, can play an important role when it becomes effectively operative.

The reminders for missing issues should be sent promptly so that the issues may not go out of stock. For this a good recording system can alert for the missing of an issue when it becomes due.

In SENDOC, reminders are issued wherever warranted while recording the periodicals daily, and again, once in a month on checking thoroughly. The period between two previous issues received and recorded in the library is treated as a normal delivery time. If the issue is not received within around that gap, a reminder is rushed. There are printed reminder cards which are filled in and sent. Usually the response to the reminders is quite encouraging especially in case of foreign publications.

A survey based on reminders sent for missing issues during 1974 reveals as under:

Country	Number of periodicals in the list	No. of reminders sent
India	338	381
UK/USA/other countries	312	304
Total	650	685

9. CONCLUSION

Though direct acquisition of periodicals from publishers means some extra cost and administrative work, this can still be considered a better method of acquisition of periodicals. It is, however, a known fact that for direct acquisition, planning is a must and delay brings many problems, such as, interruptions in supplies. The system will work smoothly as long as both the parties, namely, the publishers and the libraries perform their duties efficiently.

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COMPUTERISED REMINDERS FOR NON-RECEIPT OF PERIODICALS

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INTRODUCTION

Non-receipt of issues of periodicals is a common problem with any library. It is mainly due to loss in transit. The other reasons are wrong delivery, despatch of wrong issue number (forming duplicate), mistakes in accounting by the publisher etc.

A librarian may probably satisfy the audit by showing letters with 'extension of subscription' or 'refund of money' but not the user who suffers a gap in the communication chain created by the missing issues. Timely effort has to be made to obviate the break in the information flow. The system developed helps in simplifying the process of sending reminders promptly to acquire complete sets.

Analysis of the Problem

In India most of the periodicals are subscribed directly from the publishers or through Indian/foreign agents. This means that we have either a number of publishers or some agents covering a number of publishers, to whom reminders should be addressed. RRL-Library switched over to direct subscriptions with the publishers since 1975.

In the context of missing issues, frequency of the periodical calls for the attention of the designer of a system. The number of issues expected to reach the library should also be considered.

Overview

The system employs pre-punching of issue numbers based on the previous year's experience and punching the receipt information as and when the issues are received. A comparison of the receipt fields for non-receipt information and calling for desired output with a control by the expected number of issues for each frequency at the time of sending reminders is planned.

The system covers all the frequencies of periodicals received in the library of RRL, Hyderabad. The system is so simple that it can be operated even at a lower level of the library-staff who are trained to handle card punch and verifier.

Card Design

In this system three sets of punched cards, namely, Publisher Card, Title Card and Receipt Card are designed to accommodate the required data as described below:

Design I - Publisher Card

The publisher card contains the name and place of the publisher and a code number.

Alphabetical lists of Indian and foreign publishers are prepared. As the number of the Indian journals will not generally be more than 200 in a library, they may be allotted three-digit code numbers starting from 001 to 200. The foreign publishers may be allotted code numbers from 201 onwards. These code numbers form publisher code numbers and help in sorting out all periodicals from the same publisher.

Publisher Card Design

S.No.	Field	Data	No. of columns
1.	1-60	Name & place of the publisher	60
2.	74-76	Publisher code	3

Columns 61-73 and 77-80 blank

If the library subscribes the journals from the agents and if the reminders should be addressed to them, the agents should be treated as publishers.

Design II - Title Card

Design II relates to the Title cards, the scope of which is spelt-out-title of the periodical and the data as shown in the design below:

TITLE CARD DESIGN

S.No.	FIELD	DATA	NO OF COLUMNS
1.	1-60	Title	60
2.	74-76	Publisher Code	3
3.	77-79	Title code	3
4.	80	Design code	1

Columns 61-73 blank.

1. Title: Col. 1-60

The title of the periodical in full without the initial article, if any, is given.

2. Publisher Code: Col. 74-76

The corresponding code number of the publisher for each title is punched in columns 74-76 as decided in Design I.

3. Title Code: Col. 77-79

A three-digit serial code number (starting from 001) is allotted to each title in an alphabetically arranged list of periodicals. In libraries where more than thousand periodicals are received, four columns may be allotted. Title code number helps in linking relevant card from the Design III.

4. Design Code: Col. 80

In order to distinguish the Title cards (Design II) from the Receipt cards (Design III), Design II is identified with '+' in Col. 80 while '-' in col . 80 is given in Design III.

DESIGN III: RECEIPT CARD

Design III pertains to 'Receipt Cards' and contains information regarding the receipt of each issue of the periodicals.Information such as the date of receipt (under the respective issue number and over the 12th zone), number of reminders issued (R_1, R_2 etc with dates between zones 1 and 2 under the respective issue number) are registered in the process. All the issue numbers to be received in the current year are all pre-punched and number of 'Receipt cards' are employed depending on the frequency of the periodical. Volume number, year, frequency etc should be incorporated on all the Receipt cards.

DESIGN III: RECEIPT CARD

S.No.	FIELD	DATA	No.OF COLUMNS
1.	4-5	Year	2
2.	6-9	Volume	4
3.	11-70 excepting the 10 Receipt Information columns at S.No. 4 below.	Pre-punched Issue Numbers with indication of Vol Number	50
4.	16, 22, 28, 34, 40 46, 52, 58, 64, 70	Receipt Information	10
5.	72	Frequency	1
6.	74-76	Publisher Code	3
7.	77-79	Title code	3
8.	80	Design code	1

Columns 1-3, 10, 71, 73 blank

1. Year: Col. 4-5

The last two digits of the year are punched in these columns; e.g. '74', '75' for 1974, 1975.

2. Volume Number: Col 6-9

Four columns are allotted to represent the volume. Where the volume number is in less than 4 digits, the same may be shown as 0005, 0029, 0198 etc.

3. Issue Numbers: See the Design

Issue numbers are mostly represented in three forms: a) Serial Number, b) Name of the month, and c) Name of the month and date. Four Column unit is allocated to record issue numbers. The above mentioned 3 modes may be represented as:

a) 0001, 0058, 0139, 3496 etc.
b) JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC, leaving the first column as blank.
c) JA05, FE12, MR01, AP16, MY26, JN19, JL17, AG31, SP18, OT23, NV10, DC31.

10 issue numbers are accommodated in each punched card. These issue numbers are pre-punched based on the previous year's experience.

If there is no change in volume a blank should be left before the issue numbers. In the case of multiple volumes, blank should be left for the issues of the volume indicated in columns 6-9 and an indication should be made about the increase in volume number by prefixing 1, 2, 3 etc, for the corresponding issue numbers.

> E.g. To indicate volumes 6-8 with a change in volume for every four issues -
>
> 6-0001-0002-0003-0004-10001-10002-10003-10004-20001-20002-20003-20004.

Columns for Volume Indication:
11, 17, 23, 29, 35, 41, 47, 53, 59, and 65

Columns for Issue Numbers:
12-15, 18-21, 24-27, 30-33, 36-39, 42-45, 48-51, 54-57, 60-63, and 66-69.

4. Receipt Information: See the Design

10 columns (from column 16-70 with an increment of 6) have been allocated for punching the receipt of issue numbers. As these are chosen next to the issue numbers, a punch or non-punch denotes the receipt or non-receipt of that issue number. 'R' is punched to register the receipt of an issue.

5. Frequency: Col 72

The frequency of a periodical is coded as follows:

Frequency	Code
Quarterly $\frac{4}{12}$	1
Bimonthly $\frac{6}{12}$	2
Eight issues $\frac{8}{12}$	3
Ten Issues $\frac{10}{12}$	4
Monthly $\frac{12}{12}$	5
Fortnightly $\frac{24}{12}$	6
$>24<30$	7
$>30<40$	8
Weekly or >40	9

6. Publisher Code: Col. 74-76

See the sub-head 2 under Design II. The publisher code should be incorporated in all the receipt cards.

7. Title Code: Col. 77-79

See the sub-head 3 under Design II. The Title code should be incorporated in all the receipt cards.

8. Design Code: Col. 80

See sub-head 4 under Design II. '_' should be given in column 80 in all the receipt cards.

SYSTEM

As in the case of any manual system, the present system consists of two parts viz, a) Routine, and b) Reminders at interval.

The Title Cards and Receipt Cards are filed together (one after the other for each title) according to the Title Code to form a Master file.

a) Routine: When the issues of periodicals are received in the library, they are arranged alphabetically by the title. For each title received, relevant Title and Receipt Cards (Receipt card bearing the issue number in question) are removed from the Master File. The date of receipt is recorded under the respective prepunched issue number and above 12th zone in the Receipt Card and 'R' is marked after the issue number to register its receipt in the library. The punched cards so separated are taken to the 'Computer Room' and receipts are punched in the places where 'R' is marked in the earlier step. Required number of copies of the listings of the daily receipts are taken using the 'printer'. By comparing the list with punched cards, the issue numbers received on that day are underlined before displaying the list on the 'Notice Boards'.

The Title and Receipt cards are filed back into the 'Master File' using Title code manually or by using sorter.

b) Reminders: When reminders are to be sent, Master File is taken to the 'Computer Room'. Title Cards and Receipt Cards are separated by sorting in the Col. 80 using Design code. The Receipt cards are sorted by publisher.

A computer Programme in Fortran II has been developed to prepare reminders automatically. The program is designed to process reminders for 35 Receipt cards, bearing non-receipt information, at a time to suit the memory of our computer, viz. IBM 1620. The maximum non-receipt data that can be given in the reminder for a title is 10 issues only.

A control card is inserted as the second card in the data with the expected number of issues, for each frequency, at the time of processing reminders. As the number of issues expected to reach the library are different in the case of Indian and foreign journals suitable control cards are used while processing respective data. Two columns are used for each of the nine frequencies. The number of receipt information fields to be checked is controlled by this card.

Provision is made in the computer program to identify 'R' itself in the specified receipt fields and the volume number is also stored along with the issue number not received.

INPUT

After running the program Receipt cards are read and checked for non-receipt of issues. Non-receipt data only is stored in an array. Depending on the frequency of the periodical, the program instructs the computer as to how many more Receipt cards are to be read and kept in an array. This operation is carried for the set of Receipt cards of each title. A check of the receipt data is made for the expected number of issues mentioned in the control card for that frequency. The number of issues not received (out of the expected number) are counted and the first 10 issues are transferred into another array along with the information on Year, Volume, Frequency, Publisher, and Title code. Provision is made to place exact volume number with the corresponding issue numbers. The operation proceeds to the next set of receipt cards (of the next title). The number of Receipt cards need not be 6 for any frequency though a provision is made to store information for a maximum of 60 issues in an array. The number of cards are determined by the frequency (i.e. the number of issues per year).

If the number of receipt data exceeds 35 titles, a check is provided to end receipt cards and to load publisher data. A positive value in columns 1 and 2 should be kept at the end of the receipt data for necessary termination.

The Publisher Cards are loaded with a card at the end punched with a positive value in column 61 to denote termination of publisher data.

The Title Cards are loaded with a card at the end punched with a positive value in column 61 to demote termination of title data.

OUTPUT

The printed output is planned in the form of letter, with the following information, ready for the signature of the librarian and despatch:

a) Address of the laboratory with file number and data.

b) Name and place of the publisher.

c) Non-receipt data for each volume under their respective titles for each publisher.

d) Request to the Publisher stating 'Above mentioned issue numbers have not been received. Please send them to complete the supply'.

e) Senior Librarian at the bottom for signature.

The process is repeated for the remaining receipt data by branching back to origin.

The Computer Program used in this system and a sample reminder are presented in Appendix I and II respectively.

Acknowledgements

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APPENDIX-1

```
    REMINDER FOR NON-RECEIPT OF PERIODICALS     M S RAO AND PRASAD
    DIMENSION IYEAR(35),RECT (35,10),IPB(35),ITL(35),DATE(5)
    DIMENSIONPUB(35,15),TITLE(35,15),NV(35),TT(15),RF(60), L(9)=,
   1RT(60),FILE(3),IV(35,11),IVV(60)
    READ1,R,(FILE(I),I=1,3),(DATE(I),I=1,5),(RT(I),I=1,11)
 1  FORMAT(A1,3A4,5A4,11A4)
    DO 211 M = 1,35
    DO 108 MM = 1,11
108 IV(M,MM)=0
    DO 211ML=1,10
211 RECT(M,ML)=RT(ML)
    READ3,(L(I),I=1,9)
3   FORMAT(9I2)
    NN=0
    NM=0
    I=1
 4  READ7,IS,IYEAR(I),IVOL,NV(I),(IVV(J),RT(J),RF(J),J=1,10),
   1IFREQ,IPB(I),ITL(I)
 7  FORMAT(I2,1X,I2,I4,I1,(10(I1,A4,A1))1X,I1,1X,2I3)
    IF(IS)6,6,5
 6  GO TO(17,17,17,17,32,16,16,33,34),IFREQ
 32 READ18,(IVV(J),RT(J),RF(J),J=11,20)
    GO TO 17
 16 READ18,(IVV(J),RT(J),RF(J),J=11,30)
18  FORMAT(10X,I1A4A1,I1A4A1,I1A4A1,I1A4A1,I1A4A1,I1A4A1,I1A4A1,
   1I1A4A1,I1A4A1,I1A4A1)
    GO TO 17
 33 READ18,(IVV(J),RT(J),RF(J),J=11,40)
    GO TO 17
 34 READ18,(IVV(J),RT(J),RF(J),J=11,60)
17  LL=L(IFREQ)
 61 KK=0
    DO80K=1,LL
    IF(R-RF(K))81,80,81
 81 KK=KK+1
 80.CONTINUE
    IF(KK)4,4,82
 82 IF(KK-10)83,83,84
 84 LL=LL-1
    GO TO 61
 83 JL=1
    DO 63J=1,LL
    IF(R-RF(J))62,63,62
 62 RECT(I,JL)=RT(J)
    IV(I,JL)=IVV(J)
    JL=JL+1
 63 CONTINUE
    PLACING EXCAT VOLUME NUMBERS WITH THE CORESPONDING ISSUES.
    DO200 M = 1,10
200 IV(I,M)=IV(I,M)+IVOL
    I=I+1
    IF(I-35)4,4,107
107 TYPE130
130 FORMAT(54H RECEIPT FILE FULL LOAD PUBLISHER DATA AND PRESS START)
    PAUSE
    GO TO 131
  5 TYPE86
 86 FORMAT(20H END OF RECEIPT DATA)
131 NO=I-1
 70 READ8,(TT(I),I=1,15),IS,IP
  8 FORMAT(15A4,I1,12X,I3)
    IF(IS)51,50,51
 50 DO10J=1,NO
    IF(IPB(J)-IP)10,11,10
 11 DO52K=1,15
 52 PUB(J,K)=TT(K)
    NN=NN+1
 10 CONTINUE
    GO TO 70
 51 TYPE53
 53 FORMAT(22H END OF PUBLISHER DATA)
 2  READ13,(TT(I),I=1,15),IS,IT
 13 FORMAT(15A4,I1,15X,I3)
    IF(IS)54,55,54
 55 DO14J=1,NO
    IF(ITL(J)-IT) 14,15,14
 15 DO115K=1,15
115 TITLE(J,K)=TT(K)
    NM=NM+1
 14 CONTINUE
    GO TO 2
    OUT PUT
54  PRINT71,NO,NN,NM
 71 FORMAT(3I5)
    N=1
    NK=1
    DO23J=1,NO
    IF(IPB(J)-IPB(J+1))73,74,73
 74 NK=NK+1
    GO TO 23
 73 PRINT20
 20 FORMAT(1H1,20X,28HREGIONAL RESEARCH LABORATORY,/25X,17H HYDERABAD-
   1500009,/31X,5HINDIA)
    PRINT21,(FILE(I),I=1,3),(DATE(I),I=1,5)
 21 FORMAT(2X,3A4,50X,5A4)
    PRINT22,(PUB(J,K),K=1,15)
 22 FORMAT(///,5X,15A4)
    DO76 JJ=N,NK
    PRINT24,(TITLE(JJ,K),K=1,13)
 24 FORMAT(///1X,15A4//)
    K1=1
    K2=1
    DO 204 M =1,10
    IF(IV(JJ,M)-IV(JJ,M+1))201,202,203
202 K2=K2+1
    GO TO 204
201 PRINT206,IYEAR(JJ),IV(JJ,K2),(RECT(JJ,K),K=K1,K2)
206 FORMAT(/5H YEARI4,2X6HVOL.NOI5,2X,8HISSUE NO,(10(1X,A4)))
    K2=K2+1
    K1=K2
204 CONTINUE
203 PRINT206,IYEAR(JJ),IV(JJ,K2),(RECT(JJ,K),K=K1,K2)
 76 CONTINUE
    PRINT77
 77 FORMAT(///5X,53HABOVE MENTIONED ISSUE NUMBERS HAVE NOT BEEN RECEIV
   1ED.,
   2/5X,40HPLEASE SEND THEM TO COMPLETE THE SUPPLY.,//////,60X,
   317H SENIOR LIBRARIAN)
    NK=NK+1
    N=NK
 23 CONTINUE
    STOP
    END
```

APPENDIX-2

```
                     REGIONAL RESEARCH LABORATORY
                          HYDERABAD-500009
                               INDIA
 RRL/LIBJ/REM                                               JUNE,1976



     AMER SCIENTIST,USA



 AMERICAN SCIENTIST

 YEAR  76  VOL.NO    64  ISSUE NO 0001 0002



     ABOVE MENTIONED ISSUE NUMBERS HAVE NOT BEEN RECEIVED.
     PLEASE SEND THEM TO COMPLETE THE SUPPLY.
                                                         SENIOR LIBRARIAN
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STANDARDS FOR LAYOUT AND PRESENTATION OF IDEAS IN TRADE CATALOGUES: SOME GUIDE LINES

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1 INTRODUCTION

11 Importance of Trade Catalogues

Trade catalogues form an important source of industrial information. They often contain information about products and processes which may not even be found in books and periodicals. Besides, some brochures contain findings of research and experience, and long bibliographies of references to technical literature. Therefore, the importance of the trade catalogue and other trade literature is widely acknowledged and realized in industry.

12 Formidable Problem in Organizing the Collection

To organise the collection of trade literature, which often comes in enormous variety of size and forms of content, is a formidable problem. This is mainly due to the fact that such literature is produced for publicity and advertisement purposes and variation in shape, size and content are resorted to as publicity gimmicks. (1)

13 Catalogues at Finger-tips

It is observed that generally for any product line, designers and buyers prefer one catalogue over another, which they keep at their finger tips for ready reference. The manufacturer who provides a preferred catalogue has an edge over his competitors, for he is the first to have his product considered. This is just because of recognising the fact that one catalogue can be preferred over another if it contains those elements that will force the user to keep it at the finger tips.

14 Lack of impact on intending users

Though, it is acknowledged and realised that the trade catalogues brought out by most of the manufacturers contain valuable trade and technical information, yet in most of the cases, the information is not presented in a systematic and easy-to-use manner so as to make an impact on the intending user of catalogues.

2 SCOPE OF THE PAPER

Therefore, in order to maximise the utilisation of the trade catalogues for fulfilling their purpose, an attempt is made in this paper to outline certain guidelines in presenting the information in respect of the contents and layout of trade catalogues of products and processes in a systematic and easy-to-use manner.

3 ATTRIBUTES OF A HELPFUL CATALOGUE

Besides, various elements in a catalogue, a few general attributes of a helpful catalogue may be stated as: it should be informative; complete, accurate and easy to use. These attributes are dealt in some details below:

31 Informative

To be informative, the catalogue should:

1) convey the utility of the product in such a way that the information given there should act as a prelude to further enquirieis/discussion, paving way for liaison. If it fails, the further enquiries will not be received, but if it succeeds, the customer will want to study the subject in more detail. Thus,

if the information provided stimulates the desire for more information then its objective is achieved;

2) provide relevant information gathered from various sources and out of practical experience, so as to relieve the designer/user from the time-consuming and laborious calculations in order to select and apply a product/process to suit his requirement. Further, the inclusion of data and experience on the product function and maintenance gathered during the design and development period will be of much significance to the user of the product;

3) be specific in explanations rather than 'general', i.e. vague abstractions have to be solidified into concrete examples. For example, while describing the uses of a product it is better to list specific applications or areas of applications, instead of saying "It is a tool of 101 users"; similarly, it is better to state that "its rated production capacity is 200 pieces per hour" instead of saying "its fast";

4) provide special features of the product, prominently; and lastly;

5) include information useful for placing the 'order', so that there will be minimum time lag at the Manufacturer's end in executing the same.

32 Complete coverage

As far as possible, the above mentioned information should be given in such a way that it is complete. Many a potential customer may not take initiative to write to the manufacturers for further details, unless the catalogue gives fairly complete information which satisfactorily reveals their product's relevancy to them. Out of experience, sales engineers know the kind of information a potential customer needs and the questions the majority of them are likely to ask about their products. Efforts should be taken to answer these questions fully.

33 Accurate

Whatever information is provided it should be accurate. Inaccurate data, specifications, drawings, charts, tables and nomograms will not only spoil the image of the manufacturer (irrespective of the quality of the product), but will also cause heavy losses to the customers who rely on this information and use it.

34 Easy to use

Of all the above attributes, this attribute viz. 'easy to use' is mot important and significant; for whatever required information (collected and verified after putting lot of efforts) is given completely, accurately, the catalogue's usefulness is impaired if the user has "hard time finding his way around in it". Therefore, the matter should be presented in an organised and uniform way. For example, related products should not be scattered into different sections, but must be properly grouped, frequently consulted data should be similarly located on the pages for each products, and so on.

The trade catalogues are generally intended to be used by persons in industry, who are generally very busy. Besides, the user's time in other walks of life is also valuable, and the manufacturer cannot demand their continued attention. Because of this "time" factor, the manufacturer has to take all the trouble, so that the information presented should be of 'use' for them. Consequently, he has to use "visual aids" and 'quick' reference aids'. One cannot compress 'words' beyond certain limit without sacrificing the 'comprehension' and 'interest' of the reader, but a judicious use of tables; functional illustrations, figures etc. can communicate the same information not only faster but also much more effectively.

Also, the matter should be presented in a way most useful for organising and updating their 'collection' at the customer's end.

4 ELEMENTS OF A CATALOGUE AND OTHER ATTRIBUTES

The main elements of a catalogue are:

1 Format
  - 11 Fomat cover
  - 12 Inside front cover
  - 13 Contents page
  - 14 Inside back cover
  - 15 Back cover

2 Design

3 Words

4 Illustrations

5 Tables, charts and nomograms etc.

Besides the above main elements and the attributes mentioned in section 3, the essential attribute, however, is the planning of the catalogue which includes co-ordinating and incorporating the information keeping in view the attributes mentioned earlier. (Sec 3)

In addition to the 'nature of information' need to be produce this paper confines itself only to category 1) above i.e. Format. Even in 'format' the size of paper, type faces, printing etc. are excluded, laying emphasis on the various sections of the catalogue and the type of information to be provided thereunder, for maximum utilisation of the catalogue.

5 TYPE AND PLACE OF INFORMATION

51 Front cover

Leaving freedom for the artist or designer of the catalogue for depicting his ideas creatively, the following factors or items of information to be incorporated may be considered.

511 Catalogue No. /Publication No.

Usually every manufacturer will be assigning and printing some number on his catalogue which forms a sort of serial number of his publication programme. This number is found at different places in the catalogues issued by different manufacturers; such as on front page, right hand corner; back of the front page (below or above); on any part of the contents page; back cover; inside back cover etc. Moreover, the size of the 'Letters' is small and many times it is not prominently printed. Consequently, considerable time is wasted by the user in locating this number on the catalogue.

The importance of 'catalogue number' should not be ignored, for it is generally required to

1) Arrange the catalogue in sequence, within the catalogue file of the same manufacture and within catalogues of other manufacturers at the customer's end.

2) File the "supplements" issued, if any, from time to time.

3) Replace the old catalogue when it is superseded by a new catalogue, thus helping in distribution and maintenance.

4) Trace it in the catalogue collection, when approached from catalogue number of the manufacturers.

5) Trace the catalogue number in the "Surrogate Finding System" of the user's Library/Information system.

6) Enter the catalogue number in issue records if they are put into circulation at the users end.

In view of the above, it is recommended that the catalogue number be printed on the top right hand corner of the front cover so that one can easily locate that number always by looking at a particular place which is fixed for all the catalogues, irrespective of the organisation publishing it. This is just like printing the copy right year on the verso of title page.

512 Date of publication

It is found that catalogues seldom carry a date. Sometimes the date can be ascertained from the printers' mark (or in its absence at least the date of acquisition, if recorded by the user). In the absence of date/year, a collection of trade literature becomes chaotic after a time. Therefore, it is useful if the date/month and year of publication is given just below the 'Catalogue Number' in types than those of the catalogue number.

513 Language Symbol

Generally, when catalogues are printed in different languages for overseas markets, obviously they will have the same catalogue number as the one that is in original language. In order to distinguish them immediately by seeing the number it is essential that 'language' indication be provided. For this purpose, some symbol should be attached either to the catalogue number or to the date of publication. It is preferable, if it is suffixed to the Catalogue Number e.g. 213E where "E" indicates English Language.

514 Specific space for the Reference Number of user

When the trade catalogues are sent to the potential users, it is expected that they will file them in their collection. In case they want to allot some reference number of their own filing system, a specific place should be earmarked on the front cover. And it is perferable if it is exactly below the printed catalogue number, demarcated by a small box.

515 Names of products

Whatever may be the design of the front cover, the index/names of the principal products should be concentrated at one place on the front cover as far as possible. This is in addition to the details to be given in the contents page. If the catalogue is describing only a single product, this problem does not arise.

516 Brand names, trade marks and names of the Manufacturers

Excepting some well-known products, which have a longstanding reputation in the market, it is difficult to distinguish between the brand names and trade names for new products just by seeing the catalogue. Failure to distinguish this will bring the user into conflict with the name of the manufacturer, while recalling the catalogue. Also, the personnel who process and maintain records may find it difficult to distinguish; hence, may enter in the records one for the other, creating chaos. Therefore, proper means should be adopted while designing and printing the catalogue to distinguish the name of the manufacturer from that of the brand name, easily and quickly.

52 Inside front cover

As soon as a user opens a catalogue, his eyes will first fall on the inside front cover. To capture his attention for a while the general history and the background of the manufacturer may be given here very briefly. In case the background is not given or not preferred, then an index or 'contents' of the catalogue should be given (See also section: 53).

53 Contents page/Index

If the catalogue is long enough (say over 50 pages) have sufficient information warranting a separate contents/Index page, then a separate page may be allocated for contents immediately after the 'front cover', and an index at the end of the catalogue. On the other hand, if the catalogue is short, the contents page should serve as a detailed index to the products, giving the 'capacities' of the products as well.

54 Inside back cover

Inside back cover should give complete names and addresses of the agents with Telex/Teleprinter and cable addresses with information on "How to order", including terms and conditions of supply; and any special note such as discount, so that time and money is saved on the part of the customer who can immediately seek clarifications for special problems, after browsing through the catalogue. In order to establish liaision between the manufacturers and the user, the addresses of the agents/representatives are essential.

55 Back cover

Generally, the back cover can be left blank or some photograph of the products/firms be given. In case the terms and conditions of manufacturers occupy the whole of the inside back cover, as stated in section 54, then the names and addresses, including cable/telex of the principal manufacturer and its various agents etc. should be mentioned exclusively on the back cover. In the case of small catalogues where description of the products continues even on to the inside back cover, the matter to be given in inside back cover should be shifted to back cover. Out of several products/processes of the manufacturer, if the catalogue is produced for only one product, then the back cover should briefly give the information about other products/processes/services of the production programme/organisation. The practice of some manufacturers of giving the overall sizes and capacities of the products in a tabular form on the back cover can also be emulated.

56 General Format

561 Loose leaf/Vs bound catalogue

Before planning for the production of a catalogue a decision should be taken whether:

1) permanent or loose-leaf binding is perferable for the entire product range, or

2) a number of separate product bulletins would be better than one large catalogue.

This decision will help in investing money economically in the production of the catalogue.

562 Quick Reference Aids

The provision of "thumbs", "index tabs" with colour code and detailed indices will be an asset as it saves time while referring. For example, for easier and quicker reference the main sections of the 'Expansion Joints catalogues (No.456E of M/s. Metallschlauch Fabrik, Germany) are printed on paper of different colours as follows:

White: General subjects and information concerning three types of movement as well as special design.

Yellow: Axial absorption of movement.

Red: Laterial absorption of movement.

Blue: Angular absorption of movement.

Grey: Appendix with material tables, extracts from standards and other data sheets and conversion factors.

563 Margin for punching holes

If the catalogue is in the form of multi-folder, consisting of one or more sheets with many folds, then care should be taken to leave sufficient margin while printing, so that when complete folder is folded, required space should be left along with the margin for punching holes for filing.

564 Punched Holes

Some catalogues have ready made punched holes, having 2,4 or 6 punches for the purpose of filing. This practice of un-even number of punched holes calls for usage of file folders/flat files/ring binders having variety of rings/fastners and sizes. Such a practice is to be discouraged as it is going to create a filing problem. If at all they are to be punched at manufacturer's end, they should possess only two punches/holes and their size and distance should be according to the specifications of the standard punching machines available in the market. Otherwise, the publisher/distributor of the catalogues should provide a special binder along with the catalogues which will suit the punching made on the catalogue. However, if standard punches are made at the manufacturer's end, it will certainly help the customers in filing them immediately and thereby keeping the file upto-date.

6 DISTRIBUTION AND MAINTENANCE

Having spent large sums of money on producing a catalogue, if no proper distribution is made, it will become a liability instead of an asset. Maintaining a mailing list for distribution is good practice, but it has to be updated at least once in two years. Care should be taken regarding some customers/users, especially the engineers or decision makers who have the habit of procuring any catalogue or literature available free of charge, irrespective of its usefulness to them. In some cases where the catalogues are properly filed and can be retrieved at a latter date, and which have access to all those who need in that organisation, one or more copies can be sent to such organisations though there is no direct use to them immediately.

Distribution of the catalogues is not the end in itself. The manufacturers should see that the customers/potential users catalogues are kept upto-date. This obligation is more so, when the catalogues are in a looseleaf form. At times the customers may not sometimes, be able to keep track and file these additions and revisions properly. Therefore, serious thought should be given as mentioned before in deciding a 'loose leaf' form or 'bound' one.

After some experience in the distribution of catalogues, the suppliers must decide whether to discontinue the 'loose leaf' form or to break up a big catalogue into separate sections, whichever is suitable.

7 FEED BACK

In spite of careful planning and good printing, a catalogue may not be perfect. Since salesmen use catalogues constantly and come directly in contact with the customers and the other users of the catalogue, they can evaluate the use of the catalogue and can seek suggestions for improving the catalogue.

In order to make the next edition better, there should be a feed back of these suggestions for improving, to the agency or authority responsible for bringing out the next edition, besides incorporating any corrections, revisions subsequent to the revised production programme of the company.

8 AGENCY FOR PRODUCING AND UPDATING THE CATALOGUES

The sales manager in collaboration with the designer of the product, and the advertising man should be entrusted with the production and updating of the catalogues. This agency should comply with the guidelines and other factors mentioned in the preceeding sections in bringing on the trade catalogues for the products/processes/services of their manufacturers/enterprises.

References

[1] PRATAP LINGAM, P: Trade and technical literature: A system for document finding. (Paper presented at the Ninth IASLIC Conference, 1969).

PUNCHED CARD CONTROL FOR THE PURCHASE OF PUBLICATIONS: A Simple Device

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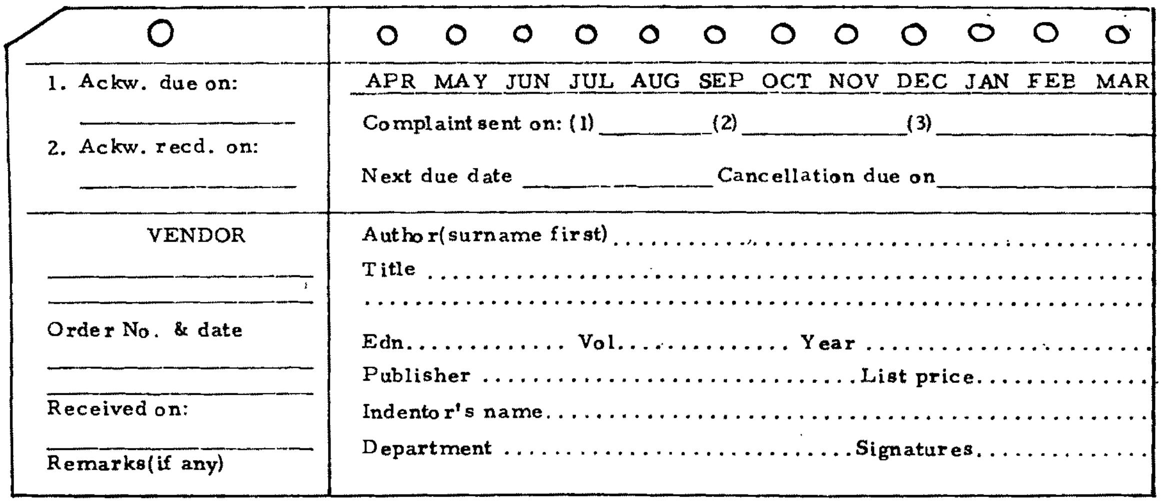
Follow up Work for Purchase

Libraries have different procedures for the purchase of books, such as, some invite quotations while others get their publications through the booksellers either on the rates fixed by the association of the booksellers (if any) or on the rates fixed by the library committee. But it is a common experience that the vendors generally supply the publications readily, if available with some well known wholesellers but in the case of publications which require some efforts to locate or are to be imported from the publishers, they do not care much until and unless there is regular tapping from the side of the libraries. In libraries also it is difficult to have a regular follow up only from the files. Particularly in the large libraries where huge purchases are made every month, some suitable device for the purpose is absolutely necessary

To overcome this difficulty and accelerate the supply, a simple and convenient device is explained here which may be of great use in getting the publications supplied at an early date. The device, however, is not expensive and is simple in operation. It can very easily be adopted in libraries with annual purchases upto about 3,000 publications.



○

1. Ackw. due on: ____________
2. Ackw. recd. on: ____________

VENDOR ____________ ____________

Order No. & date ____________ ____________

Received on: ____________

Remarks(if any)

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR

Complaint sent on: (1) ________ (2) ____________ (3) ____________

Next due date ______________ Cancellation due on ____________

Author(surname first) ....

Title ....

....

Edn. .... Vol. .... Year ....

Publisher .... List price. ....

Indentor's name. ....

Department .... Signatures. ....

Fig. 1. Ident Card Design

Fig. 2 –
the firs
on the .

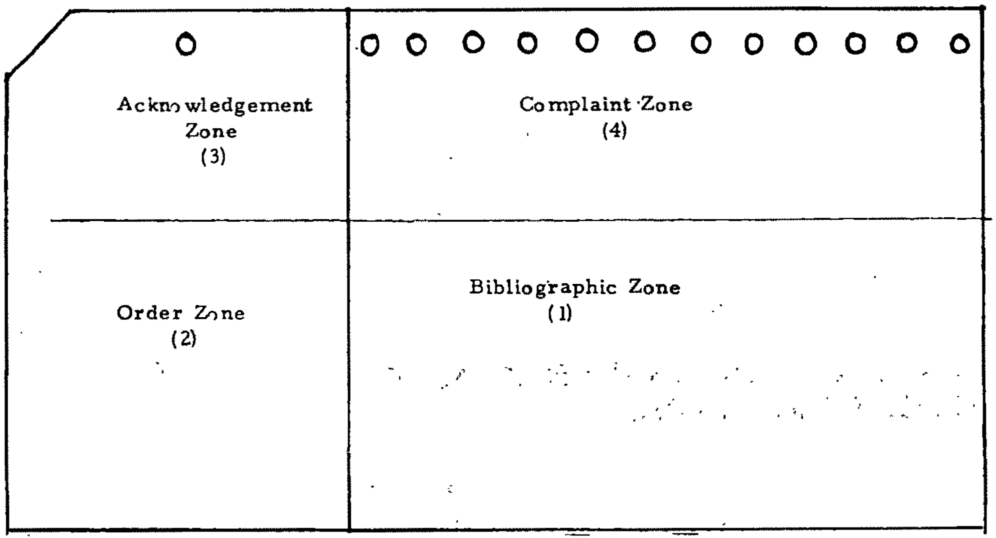


Fig. 2. Position of the first four zones on the Indent Cara

Instruments and Stationery Required for the Device

1. Sorting needle:	For sorting of the cards. A knitting needle of about 12" length can be used for the purpose.
2. Hand Punch:	For punching the sides of the cards.
3. Indent cards:	The design of the indent card is shown in Fig. 1. Necessary modifications may be made in the text of the card according to the requirements of the particular library.

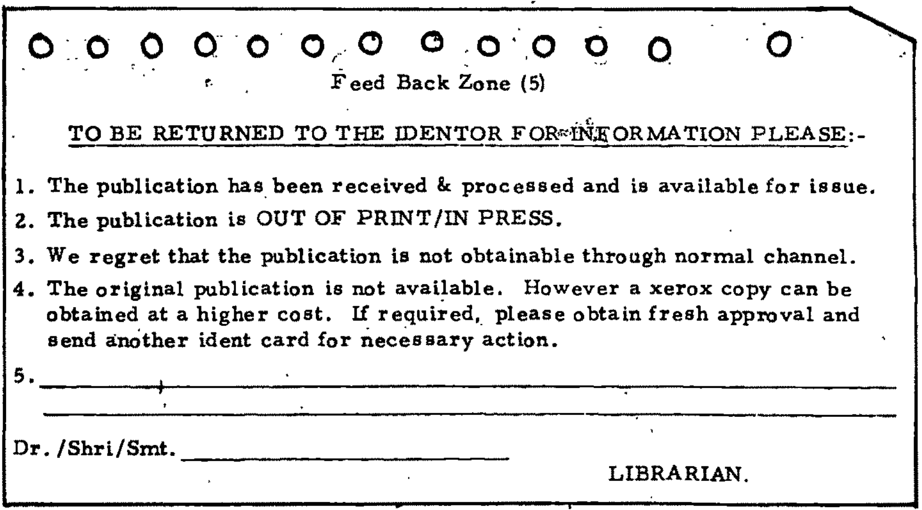
The particulars in the format of the card can be grouped into five different zones as follows:

1. Bibliographic Zone;
2. Order Zone;
3. Acknowledgement Zone;
4. Complaint Zone; and
5. Feedback Zone.

Out of these zones 1 to 4 are on the front side of the card whereas zone 5 is on the back of it. The placings of the zones 1-4 are shown in Fig. 2.

1. Bibliographic Zone: It contains information about the particulars of the publication under order. It also contains the details about its indentor.

2. Order Zone: In this zone, the details of the order and vendor are given.



Feed Back Zone (5)

TO BE RETURNED TO THE IDENTOR FOR INFORMATION PLEASE:-

1. The publication has been received & processed and is available for issue.
2. The publication is OUT OF PRINT/IN PRESS.
3. We regret that the publication is not obtainable through normal channel.
4. The original publication is not available. However a xerox copy can be obtained at a higher cost. If required, please obtain fresh approval and send another ident card for necessary action.
5. ______________________________
____

Dr./Shri/Smt. ____________________

LIBRARIAN.

Fig. 3. The Fifth Zone on the back side

3. Acknowledgement Zone: This zone contains one hole on the top and details of the due date of acknowledgement, reminder for it and the actual date of the receipt of the acknowledgement of the order by the vendor.

4. Complaint Zone: This zone contains twelve holes in a row at the top of the card. These can be designated from APRIL to MARCH (The financial year) or JANUARY TO DECEMBER depending upon the requirement of the library. The information regarding complaints sent to the vendor for non-receipt of the publication can also be given in this zone.

5. Feedback Zone: On receipt of the publication or otherwise when necessary, the indentor has to be informed of the position accordingly. Such items of information are noted down on the Feedback Zone and the card is to be returned to the indentor. (Fig.3)

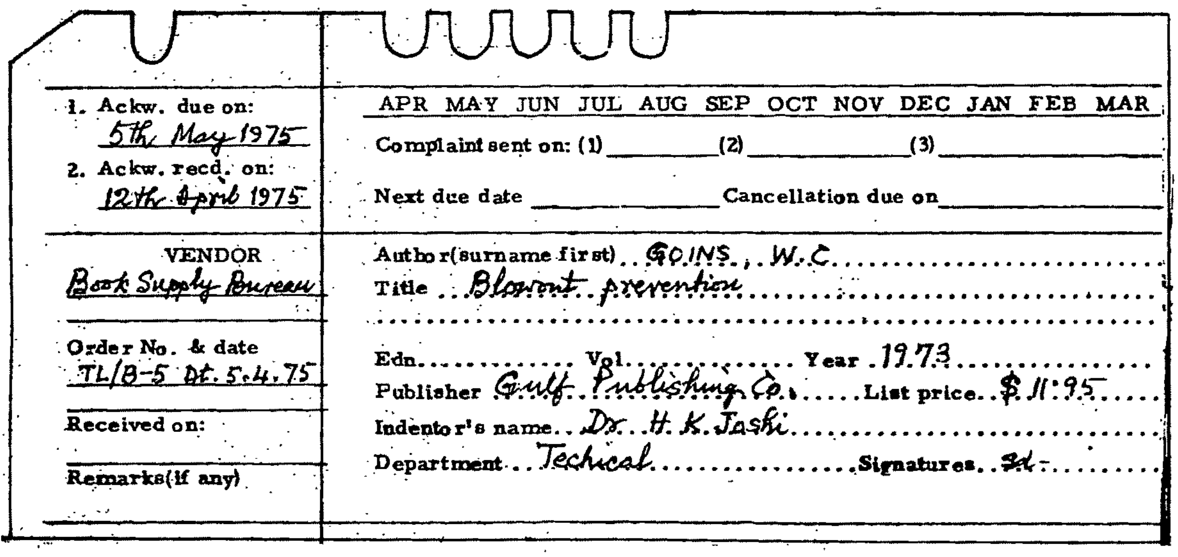
Procedure

On receipt of the indent, the necessary details about the publication and the indentor are filled-in in the Bibliographic Zone. The order is then sent to a vendor (after completing the procedural formalities followed in the library) asking the firm to acknowledge the receipt of the order and intimate approximate due date for supply of the publication. This information should reach the library within a month from the date of the order. As soon as the acknowledgement is received, the particular card is taken out from the tray and an approximate date of the supply of the order is fixed, if not already given by the vendor. The portions above the hole in the acknowledgement zone and all those corresponding to the months between the due date of supply and the month in which acknowledgement has been received are cut by the hand punch. For example, if an order is placed in the month of APRIL it will be due for supply latest by the month of AUGUST. Therefore, the portions above the holes corresponding to the months of APRIL, MAY, JUNE, JULY & AUGUST are cut so that the card is not sorted out in these months because no action is to be taken prior to SEPTEMBER (Fig. 4).

Now the indent card is filed in a tray alphabetically according to authors. A particular date is fixed on which every month, the cards will be sorted for checking the position of the supply and necessary action taken wherever needed.

The sorting starts from the acknowledgement zone. The full deck of the cards is taken and the sorting needle is passed through the hole of all the cards under this zone and are lifted up with the help of the needle.

Those cards for which this zone has been punched, meaning thereby that the acknowledgment has been received, will fall down and the cards with unpunched acknowledgement zone will remain hanging on the needle. These unacknowledged card are taken and the due date of acknowledgement is checked on each card. If the acknowledgement is not yet due, the card is filed back in the deck at its proper place. If the due date of acknowledgement has already passed, a reminder is sent to the vendor allowing him one month more for intimating the supply position. The date of this reminder is noted on the card and the same is filed in the deck at its proper place. If one such reminder has already been sent earlier, the date of sending the reminder may be checked. There may be two possibilities: This date is either before the previous sorting date or after it. The former case will show that the further grace period has also expired without getting any reply from the vendor. Now there is no sense



1. Ackw. due on: 5th May 1975
2. Ackw. recd. on: 12th April 1975

VENDOR
Book Supply Bureau

Order No. & date
TL/B-5 Dt. 5.4.75

Received on:

Remarks(If any)

APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR

Complaint sent on: (1) ________ (2) ________ (3) ________

Next due date ________ Cancellation due on ________

Author(surname first) GOINS, W.C

Title Blowout prevention

Edn. .... Vol. .... Year 1973

Publisher Gulf Publishing Co. List price $ 11.95

Indentor's name Dr. H. K. Joshi

Department Techical Signatures Sd-

Fig.4. A filled-in and punched Indent Card

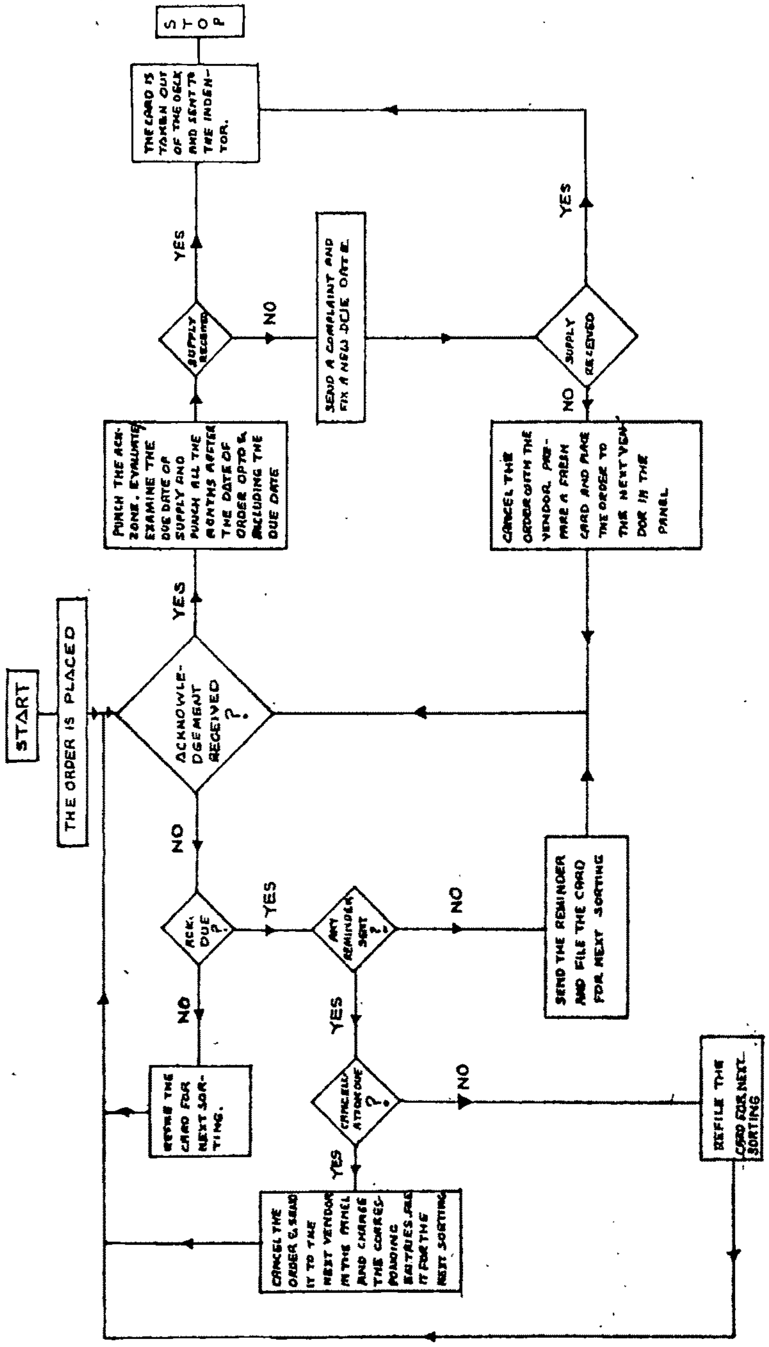

START
THE ORDER IS PLACED
ACKNOWLEDGEMENT RECEIVED ?
YES
NO
PUNCH THE ACK. ZONE, EVALUATE, EXAMINE THE DUE DATE OF SUPPLY AND PUNCH ALL THE MONTHS AFTER THE DATE OF ORDER UPTO & INCLUDING THE DUE DATE
SUPPLY RECEIVED
YES
THE CARD IS TAKEN OUT OF THE DECK AND SENT TO THE INDENTOR.
STOP
NO
SEND A COMPLAINT AND FIX A NEW DUE DATE
SUPPLY RECEIVED
YES
NO
CANCEL THE ORDER WITH THE VENDOR, PREPARE A FRESH CARD AND PLACE THE ORDER TO THE NEXT VENDOR IN THE PANEL
ACK. DUE ?
NO
REFILE THE CARD FOR NEXT SORTING.
YES
ANY REMINDER SENT ?
NO
SEND THE REMINDER AND FILE THE CARD FOR NEXT SORTING
YES
CANCELLATION DUE ?
YES
CANCEL THE ORDER & SEND IT TO THE NEXT VENDOR IN THE PANEL AND CHANGE THE CORRESPONDING ENTRIES. FILE IT FOR THE NEXT SORTING
NO
REFILE THE CARD FOR NEXT SORTING

Fig. 1: SCHEMATIC FLOW CHART

Fig. 5 - SCHEMATIC FLOW CHART

in waiting any more. The order with this vendor is to be cancelled and publication re-ordered with the vendor next in the panel. In this case a fresh card is to be prepared and the earlier one may be destroyed.

In the second case, when the date of the reminder sent is later than the previous sorting date, the grace period has not yet expired, hence the card may be replaced in the deck at its proper place.

Now let us consider the cards which have fallen down from the sorting needle. These cards are taken together. The sorting needle is taken and passed through the holes of all the cards corresponding to the month for which the sorting is being done. Again, some cards which are punched above that hole will fall down. This means that the due date for the supply of those publications has not yet arrived. The cards hanging on the needle indicate that these publications were due for supply in the preceeding month and the same are delayed. The complain zone is checked for any entry therein and if this zone is blank, a complaint to this effect should be sent allowing the vendor a period of one month more for supply. The date of the issue of the complaint is noted in the complaint zone. The hole for the respective month is punched and the card is replaced in the deck for its next sorting.

If in the meantime, some information from the vendor is received about the probable date of supply, the card is taken out from the deck and all the holes corresponding to the months upto and including the said month are punched and the card replaced in the deck at the proper place.

There will be cases, where there is already an entry in the Complaint Zone, the grace period for the supply has already lapsed without any response from the vendor. Such cards are separated and a formal cancellation of order is issued. The publication is then re-ordered to the next vendor in the panel. A fresh card is prepared and the old one is then destroyed.

As soon as the publication is received, the corresponding card is taken out from the deck and kept with the publication. After the technical processing of the publication is over, the necessary entries in the Feedback Zone are completed and the card is sent to the indentor for information about the receipt of the publication.

It is expected that the device explained here would be very useful on account of its being economical, simple in mechanism and easy in operation.

A SCHEMATIC FLOW CHART showing different phases of action is also given in figure 5 (previous page).

READING THROUGH LIBRARIES WITH REFERENCE TO MANIPUR – A CRITICAL STUDY

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Jawaharlal Nehru University
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0 Introduction

Learning is a continuous process which one starts, consciously or unconsciously, from the day of his or her birth till the day of his or her death. Learning means acquiring knowledge about things, phenomena, persons etc. and integrating this knowledge with the knowledge already stored in memory. Reading is one of the most effective processes of conscious learning and enhancing one's knowledge. Reading is an intellectual action which is possible only if a man has formed a habit of reading and practising it since childhood. There are some problems related to reading:

i) What is to be read keeping in view the proliferation of knowledge and the tremendous speed with which the reading material is brought out?

ii) Can one afford to procure all the available material due to considerably high cost of such material?

iii) Is reading material available in abundance to allow every person to have a personal copy?

iv) Is there sufficient space available to everybody to keep reading material?

v) Is it possible for an individual to take out a desired reading material or information out of the collection of entire reading material without loss of time?

1 Reading through Libraries

Success of democracy lies in well informed people. The main source of information is reading material, i.e. books, journals, newspapers etc. and these can be made available to the people through libraries. The high literacy (32.9%) in Manipur is an encouraging sign. The Government, in democratic countries, is responsible for providing facilities for education and achieving 100% literacy. Making people literate, it is all the more necessary to keep them informed in order to make the nation healthier and stronger.

The importance of libraries has been recognised in all quarters. All the problems related to reading raised in the preceding section can be solved by way of providing effective and efficient library facilities. In other words, by establishing libraries, well equipped with reading materials; fitted with good furniture; housed in places where sufficient space is available not only for stacking reading material but also for consultation; manned by staff members who have acquired knowledge in organisation and dissemination of recorded knowledge; and supported by adequate budgetary provisions for the maintenance and development, the problems related to reading can be solved.

2 Libraries in Manipur

In succeeding sections, I shall discuss libraries in schools and public library system in Manipur. Due to lack of space I shall not be able to discuss college libraries.

21 Libraries in Schools

It has been said "once the child has been taught to read and brought to love books, they are the main avenues by which he can explore for himself the wealth of human experience and knowledge". It is true that if children miss the opportunity of getting in touch with books at this stage, in their later life it will be hard to acquire reading habit. But sound foundations for the use of books at this stage will prove many children to be voracious readers who will read many books. School libraries can meet this requirement of children in the best possible manner.

Table showing the number of schools in Manipur

Sl.No.	Nature of Schools	No. of Schools	Total each categorywise
1.	Pre-Primary/Primary/ Jr. Basic/Upgraded Jr.	a) Boys 2189 b) Girls 320	2509
2.	Middle/Sr. Basic/Jr.High Schools	a) Boys 359 b) Girls 36	395
3.	High/Higher Secondary/ Multipurpose Schools	a) Boys 104 b) Girls 19	123
	Total No. of Schools		3027

Note: The figures are provisional
Source: Manipur at a glance 1973. Dept. of Statistics, Govt. of Manipur

In most of the schools in Manipur, library facilities are quite inadequate. One may not hesitate to say that the libraries in schools exist only for name sake. Such a situation hampers the progress of the students which will have its adverse repercussions on the students throughout their life as they are not provided with the opportunity to form reading habit at the right time. The school libraries in Manipur suffer from the following handicaps:

i) Lack of sufficient financial resources to equip libraries with literature for school children--books, reference works for children, picture books, journals etc.

ii) Lack of space

iii) Lack of trained personnel

iv) Apathy of the authorities towards libraries.

In the annual plan for the year 1974-75, of Education in Manipur, a provision for Rupees one lakh has been made for supplying library books to 500 primary schools at the rate of Rs 200/- each. By the end of 4th Five Year Plan 182,000 children were in primary schools. Therefore, allocation for books to primary schools is about Rs 0.52 per student which is very insignificant at the initial stage. Again, the books will be supplied to schools. It would be desirable to give autonomy to head masters in schools to procure books keeping in view their own requirements.

However, no provision has been made in this annual plan for the purchase of books in Middle, High, Higher Secondary and Multi-purpose higher secondary schools. This aspect has either been overlooked or neglected. The authorities should give attention towards setting up of libraries in schools particularly, High, Higher Secondary and Multi-purpose higher secondary schools.

It is worth making a note of the recommendations made in the Seminar of Educationists on Educational Problems of Manipur held at Imphal from 4 through 6 January 1971. The Seminar was organised by the Education Department of the Government of Manipur. Recommendation No. 13, relating to libraries reads as follows:

"Lack of library facilities--In most of the schools and colleges, the library service is quite inadequate. The students are not taught the habit of systematic reading as most of the schools do not own a full-time librarian and a well furnished library room.

Hence, it is recommended that the school libraries of high and higher secondary schools in particular be improved by providing adequate number of books and journals, by appointing a full-time school librarian and by providing a separate room or building for library with reading facilities".

Recommendation No.7 on lack of accommodation, furniture, teaching aids and equipment made in the above mentioned Seminar categorically states "... the grant in aid rules be revised and be amended to include provisions for giving non-recurring grants for major works such as building, purchase of library books and science equipment etc.".

The recommendations of the Seminar relating to libraries in schools can be summed up as follows:

i) To provide adequate number of books and journals to libraries in schools particularly high and higher secondary schools.

ii) Appointment of whole-time librarian in high and higher secondary schools.

iii) To provide separate room or building for library with reading facilities.

iv) To make provisions for non-recurring grants for purchase of library books and journals.

This Seminar was a landmark in the history of education in Manipur. It is only by putting these recommendations into practice, we can achieve ideal libraries in schools and through this agency (libraries) inculcate reading habit among children. It is high time that the authorities in the Education Department who took initiative and pains to organise this Seminar give practical shape to its recommendations.

Only Sainik School and Central School, Imphal, have been able to provide tolerably good library services to their students. Both the schools have acquired some reading material and provided space for library. They have also appointed trained libraries.

22 Public Library System in Manipur

The establishment of public libraries in Manipur, exclusively out of public funds, was almost a new experiment which started with the inauguration of a District Library and Children's Library-cum-Museum in the year 1958. During the third five year plan period the District Library was upgraded to the status of State Central Library, 14 block libraries were established at block headquarters and 145 village libraries were opened. The children's library-cum-museum was amalgamated with State Central Library on 26th August 1970 and since then it is functioning as one of the wings of the latter. During the fourth five year plan period the State Government decided to establish District Libraries in all the six districts. This target could not be achieved because of lack of funds. Four District Libraries were established in 1974-75 at Mao (North District), Churachandpur (South District), Ukhrul (East District) and Tamenglong (West District). It has been proposed to establish three more District Libraries, one at Chandel, headquarters of Tengnoupal District and two libraries in the Central District including one at Jiribam (likely to get the status of a district). The number of libraries of different grades functioning in Manipur at present are given below:

1.	State Central Library	1
2.	District Libraries	4
3.	Block & Village Libraries	159
	Total	164

221 State Central Library

State Central Library is located in the heart of the capital. It has a collection of about 130,000 books and is getting about 410 periodicals and dailies. It has registered about 9,300 members. Even a layman after a short visit to the State Central Library may say that it is not a functional library. This is more or less a lending library. Those who are working in the State Central Library know the problems and handicaps of the library better. As a librarian, I have observed that the State Central Library suffers from the following handicaps:

i) Lack of space
ii) Lack of necessary furniture and equipment
iii) Lack of trained personnel
iv) Limited hours of work
v) Lack of planning
vi) Lack of resources

A State Central Library is supposed to cater to the requirements of the entire population of the State in general and to the population of the place where it is situated in particular. The area of Imphal Municipality is 29.57 sq.km with a population of 121.761 (1971 census). Partly because of distance and partly because of difficult and costly transportation, people residing in areas like Khurai, Singjamei, Lamlong Bazar, Chingmeirong, Brahmapur, Sangaipat etc. (located far from the place of the State Central Library) find it almost impossible to avail of the library facilities.

Efforts should be made to establish at least four Branch Libraries in different areas (keeping in view the distance from State Central Library and population) so as to facilitate people residing in the outskirts of the city to avail of the library facilities. This can be done without involving additional financial burden. The multiple copies of books available in State Central Library can be transferred to Branch Libraries. The staff member from the State Central Library can be posted at various Branch Libraries.

222 District, Block and Village Libraries

District libraries have come into existence very recently. Those libraries have not yet taken shape. It is very necessary to plan these libraries properly even at the initial stage keeping in view establishment of a network of libraries in the State.

Block and village libraries exist only for name sake. Their contribution towards providing library service to people in the modern sense is almost nil.

223 Library Finance

During the fifth five year plan a provision of Rs 10.00 lakhs has been made for library services in the State. In the annual plan 1974-75 of Education in Manipur a provision of Rs one lakh has been made under the head "Other Education Schemes" subhead "Library services to districts and interiors" which is Rs 10,000 less than the previous estimates. In the approved annual plan 1975-76 of Education in

Manipur a provision of Rs 40,000 has been made under the head "Culture" subhead "Library services to districts and interiors". Earlier estimate to districts and interiors". Earlier estimate was Rs.3.00 lakhs. Out of this, Rs 1.50 lakhs was marked for construction of the buildings of three district libraries. There is no mention of State Central Library, Block and Village Libraries in the above mentioned annual plans. As per these annual plans library services in the State have got a share of 1.3% during 1974-75 and 0.57% during 1975-76 of total budget on education. And, per capita expenditure on library services is about 9 paise during 1974-75 and about 3.7 paise during 1975-76 (as per 1971 census).

It is a matter of great concern that the importance of the institution of library has been neglected.

3 CONCLUSION & SUGGESTIONS

3.1 Target of Library Service Stations

If our nation is to progress, we will have to keep people informed and the best agency to perform this task is public libraries. Efforts should be made to establish a network of libraries throughout the State. As 86.82% of total population of Manipur belong to rural areas, emphasis should be given on establishing rural libraries and service to people in the interior by way of mobile libraries. Manipur has one city, 6 districts, 7 towns and 1949 villages and hamlets. Our target should be as follows:

Service Station	No. needed
State Central Library	1
City Central Library	1
City Branch Library	4
Rural Central Library	6
Rural Branch Library	8
Rural Delivery Station	822
Total Service Stations	842
Librachine	41

As it is not possible to achieve the target in near future, it is desirable that any effort in establishing library service stations should be made keeping in view the above mentioned target.

Four City Branch Libraries in Imphal may be opened immediately as suggested in section 221.

32 Library Finance

Necessary budgetary provisions for library services should be made under the head 'Library Services' and it should be further subdivided into the following sub-heads:

i) State Central Library;
ii) District Libraries; and
iii) Village libraries

It is also essential to make necessary budgetary allocation, so as to provide library service of some standard and not merely establishing libraries.

33 Library Staff

We have already discussed the importance of trained librarians to man a library. Efforts should be made to have required number of trained librarians in all the libraries. This work can be done in two ways.

i) All the new post will be filled in by appointing trained librarians, only

ii) Those who are already working in libraries will be deputed to undergo training in Library Science.

34 Library Education

The nearest University imparting education in Library Science is Gauhati University. Only a limited number of candidates from Manipur are able to get admission in Gauhati University and secondly, it is expensive. As there is great demand for trained librarians (requirements of schools, colleges, University Centre, Public Libraries, special Libraries and Government Libraries) it will be desirable to create necessary facilities for library education in the State.

35 School Libraries

It should be made essential for the schools to have a library of their own and appoint a full time trained librarian.

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IMPACT OF PRICE HIKE AND SORING FOREIGN EXCHANGE CONVERSION RATES ON SPECIAL LIBRARIES

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An industrial undertaking has to maintain, for use by its technicians, research workers and others an up-to-date technical library. The task of keeping pace with the latest development of technological improvement makes it essential for such a library to obtain books, journals and other documents in almost all fields of science and technology. In India the main collections, however, have to be in English. Indian technical libraries are, therefore, to depend mainly on foreign publications which are imported. The procurement of the latest required publications at the earliest is one of the essential pre-conditions for efficient library service.

Cost of publications

Price hike of scientific and technical publications is becoming a great hindrance for the normal growth of a library. Throughout the world prices of all publications are showing a trend of meteoric rise. Since funds are limited and in general decreasing, libraries have to curtail their intake. Collected ecivence clearly reveals a sharp increase in the rate of cancellation of journal subscriptions. This is not a healthy sign for a technical library, particularly the one which is feeding the R&D group of scientists. A technical library, for paucity of funds, may keep suspended its book intake temporarily, but it cannot think of discontinuing the serial publications, particularly technical journals. Though now-a-days it is inevitable. As a consequence a technology gap is being created.

It is reported that since 1970 publications from UK on science and technology (taken as a whole) have shown an increase in prices by 113.1% [1]. The increasing trend of prices of thirteen leading journals in astronomy and astrophysics is 186.4%, of 29 nuclear science and technology journals is 144.1%, of 42 top journals in mathematics and statistics is 139.2% and of 22 main journals in biophysics, bio-chemistry and microbiology collectively have shown an increase of 151.18%. The general figure masks greater increase in particular scientific and technical subjects.

It is also reported that the subscription prices of U.S. journals are showing steep increase at an average rate of 13% per year [2]. The increase in the prices of chemistry, physics and engineering journals are the highest, averaging about 20% in 1972 over 1971. During 1973 the price increase of periodicals was 22% over the previous year. Chemistry and physics journals continue to be the most expensive with engineering closely following. Those published by commercial publishers cost 5 to 6 times higher than those published by learned societies. In India, since foreign exchange conversion rate escalation is appreciable we have to pay much higher prices.

Table 1 indicates the steep increasing trend of journal subscription costs. A special library had to spend Rs 11,630.50, 15,986.50, 18,713.50, 20,584.50, 26,995.80 and 29,803.50 as subscription for these thirty and odd periodicals during 1970 and between 1973-1977 respectively. It may be seen that, taking 1970 as base year, the subscription rates were increased by 35.45, 60.90, 76.99, 132.11 and 156.25% respectively (Figure 1).

An average technical library is subscribing to about 150 journals. In addition, several journals are also received free or in exchange. The total increase in subscription costs can easily be understood.

Many libraries are members of foreign and Indian learned societies/associations. By virtue of their association with such bodies they are getting a few more journals free of cost. Membership subscriptions of learned bodies, however, have also increased substantially. American Society for

Metals (ASM) and American Society for Testing and Materials (ASTM) have recently increased their membership fees by 30% and 50% respectively. Iron and Steel Institute, Japan have also increased their membership subscription from Yen 4500 to Yen 6000. Indian counterparts are no exception. Although a substantial discount on the full price of their publications are still being offered the price advantage has been somewhat reduced.

Table II is showing the increased prices of a few indispensable books and standards for iron and steel industries.

Figure II is showing the trends of increased prices for USA books. The percentage increase of actual price in US dollar and the percentage increase in rupee (considering conversion rate escalation) have been depicted separately. It may be seen that the price of "Making Shaping and Treating of Steel" - the Bible for the metallurgist was increased by 78% and 390% during 1964 and 1971 respectively over 1957 price. Similarly the publication 'Dewey Decimal Classification', indispensable for the libraries, has shown an increase of price of by 22.2%, 48.1%, 138.5%, and 274.0%.

The price increasing trend of UK publications is no better. A typical example may be cited of British Standard 970 (En series of steels). The price of this publication was 15 shilling in 1969 and is now £26.30, a 3506% increase. Of course this standard has been amended and is now being published in 6 parts.

Foreign exchange conversion rates

A library in a developing country like India is hard effected by two different increases: (1) Steep increases in cost/price and (2) conversion rates escalation. Since, in India the main collections are in English, we are getting our requirements either from or through USA and UK. Some German and Swiss publications are also obtained. Figures III and IV are showing the escalation trends of foreign exchange conversion rates in rupees for the currencies of the above countries. For US dollar, pound sterling and Deutsche mark 1964 has been taken as base year, when their conversion rates were Rs 4.00, Rs 13.00 and Rs 1.13 respectively. For Swiss francs the base year is 1971 when its conversion rate was Rs 1.50.

The current booksellers' conversion rates of these currencies in India are Rs 9.70, Rs 16.00, Rs 3.80 and Rs 3.90 respectively. It is evident that the percentage increases over 1964 rates are 128.93, 14.29 and 236.28 respectively for US dollar, pound sterling and DM. The same for Swiss francs over 1971 is 160.00.

Since pound sterling has recently been devalued its conversion rate in rupee has dropped from about 19.00 in 1975 to Rs 15.00 in 1976. Therefore, its percentage increase is now indicating less. This figure, however, was about 36% in 1975 over 1964 rate.

Budget provision for the libraries

It can be shown, taking 1970 as the base, that the allocation of funds to the libraries, barring one or two exceptions are on the decrease. Average increase of prices since 1970 to date is 160.0%. To cope with the increased expenditure, even to maintain the existing services and facilities, more funds are needed. But common practice is that during austerity drive the library is invariably the first target for cost reduction.

In India, the Science & Technology Plan recognizes the need for developing a Scientific and Technical Information System. And it is now universally recognized that technical information is as vital a tool as finance, equipment, etc., for the industrial development. A properly coordinated Scientific and Technical Information System requires a well equipped special library. It is, therefore, considered essential that the management keeps in view the existing price structure while considering the allocation of funds for the libraries. If at all a library is to be kept it should be maintained as an essential and effective tool for the industry and industrial research and not as an ornament to the organization.

Conclusion

In steel industry, particularly of special steels, a highly specialized well equipped technical library is a must to feed its readers — scientists and technologists, particularly the R&D group. This library should arrange to procure the latest publications in its fields of interest at the earliest and to the maximum extent possible.

As a result of soring prices and conversion rates escalation these libraries are hard hit. Journals, just as technical books, have been caught between escalating prices and severe budget restrictions. This is, however, a universal problem. In developing countries the problem is more acute. A further burden the Indian libraries have to bear when the publications are obtained through local agents/book sellers. Some unscrupulous book agents normally charge exchange rates much higher than the official ones on the plea that these have been fixed by the Good Offices Committee constituted by the Central Government.

Recently US $ value all over the world has been enhanced and some foreign publishers and book agents particularly from U.K. and Japan, are taking advantage of this situation and submitting their bills/invoices in US $ instead of their own. As a result Indian libraries are to pay much more for publications from those countries. To stop this practice forthwith some negotiation and action at Government level is desirable.

Acknowledgement

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TABLE I

Subscription cost of Technical Periodicals

Sl. No.	Title	Currency	1970	1973	1974	1975	1976	1977
1.	Acta Metallurgica	$	75.00	85.00	100.00	130.00	150.00	165.00
2.	Analytical Chemistry	$	15.00	20.00	20.00	22.00	22.75	24.00
3.	Analyst }	£	15.00	37.00	37.00	48.00	72.00	87.00
4.	Analytical Abstracts }							
5.	Proceeding of Chem. Soc. }							
6.	British Medical Journal	£	12.00	15.00	15.00	18.00	23.00	33.00
7.	Control Engineering	$	15.00	15.00	15.00	15.00	20.00	20.00
8.	Engg. Materials & Design	£	3.00	7.50	7.50	7.50	12.00	12.00
9.	Engineering Fracture Mechanic	$	60.00	70.00	70.00	85.00	100.00	110.00
10.	Fire Protection Review	£	3.00	4.00	4.00	4.00	6.00	8.00
11.	Int. Jnl. of Machine Tool Design & Res.	$	40.00	45.00	45.00	50.00	55.00	59.00
12.	Iron & Steel Engineer	$	10.00	10.00	10.00	20.00	20.00	20.00
13.	Iron & Steel International	£	5.50	6.00	8.00	14.00	16.00	20.00
14.	Material Sc. & Engineering	SF	500.00	540.00	630.00	725.00	775.00	800.00
15.	Metal Abstract }	$	380.00	455.00	525.00	525.00	672.00	672.00
16.	Metal Abstracts Index }							
17.	Metallurgia & Metal Forming	£	3.00	5.50	6.00	8.40	12.50	18.00
18.	Metallurgical Transaction A }	$	20.00	24.00	24.00	24.00	43.00	*43.00
19.	Metallurgical Transaction B }							
20.	Metallurgist	$	125.00	175.00	175.00	175.00	220.00	220.00
21.	Metal Sc. & Heat Treatment	$	95.00	150.00	150.00	150.00	198.00	209.00
22.	New Scientists	£	4.00	6.50	8.50	9.35	16.40.	20.00
23.	Operational Research Quarterly	$	14.00	25.00	25.00	40.00	45.00	60.00
24.	Physics of Metals & Metallography	$	140.00	165.00	180.00	180.00	200.00	230.00
25.	Review of Scientific Instrument	$	25.00	30.00	35.00	38.00	48.00	54.00
26.	Scripta Metallurgica	$	45.00	50.00	50.00	65.00	75.00	85.00
27.	Sheet Metal Industries	£	5.50	8.20	8.80	12.00	15.00	27.00
28.	Stahl-und-Eisen	DM	120.00	130.00	130.00	130.00	130.00	165.00
29.	Steel in the USSR	£	30.00	32.00	37.00	37.00	50.00	70.00
30.	Steel Times	£	6.00	8.80	9.40	12.00	15.00	20.00
31.	Refractories	$	95.00	150.00	150.00	150.00	187.00	198.00

*Member's rate

TABLE II

Price structure of few indispensable publication

Sl. No.	Title	Ed/year of pub.	Rs.	Remarks
1.	The Making Shaping and Treating of Steel	7th (1957)	45.00	These were purchased direct,
		8th (1964)	80.00	price in India was/is much more
		9th (1971)	220.00	
2.	Dewey Decimal Classification	15th (1951)	135.00	Purchased through Indian book
		16th (1958)	165.00	sellers.
		17th (1967)	200.00	Direct purchase would have cost
		18th (1971)	322.00	much less.
		19th (1976)	405.00	
			US $	
3.	ASTM Standards (full set)	1972	414.00	These are membership prices.
		1973	465.00	Actual price is about double.
		1974	550.00	
		1975	585.00	
		1976	775.00	
		1977	840.00	
4.	S A E Handbook	1971	40.00	
		1974	50.00	
5.	Metals Hand book	Vol. 1 (1961)	10.00	-do-
		Vol. 6 (1971)	14.75	Price of Vol.I is now $ 47/50
		Vol. 7 (1972)	15.75	and Vol. II $ 54.00
		Vol. 8 (1973)	19.50	
		Vol. 9 (1974)	25.00	
		Vol. 10(1975)	25.50	
		Vol. 11(1976)	26.25	
6.	Metal Statistics	1971	8.40	
		1975	20.00	
			(£)	
7.	World Stainless Steel Statistics	1972	15.00	
		1973	20.00	
		1974	25.00	
		1975	25.00	
		1976	28.00	
8.	Refractories for Iron & Steel Making	1974	10.00	
		1975	15.00	
9.	Electroslag Refinery	1974	9.00	
		1975	15.00	
10.	Vacuum Degassing	1974	1.50	
		1975	3.20	
11.	British Standard 970 (En series)	1969	0.75	
		1973	26.30	

FIG. I

INCREASING TREND OF JOURNAL SUBCRIPTIONS

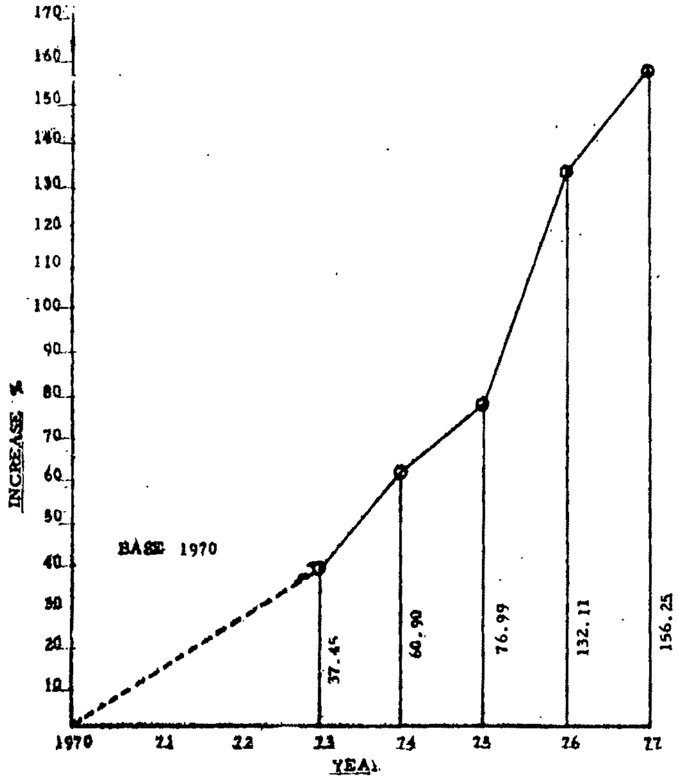


FIG. II

INCREASING PRICE TREND: US BOOKS

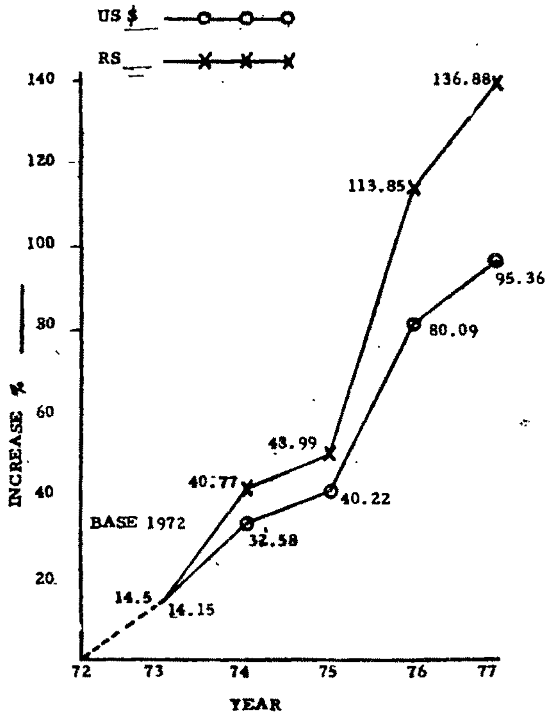


FIG. III

INCREASING TRENDS OF FOREIGN EXCHANGE CONVERSION RATES

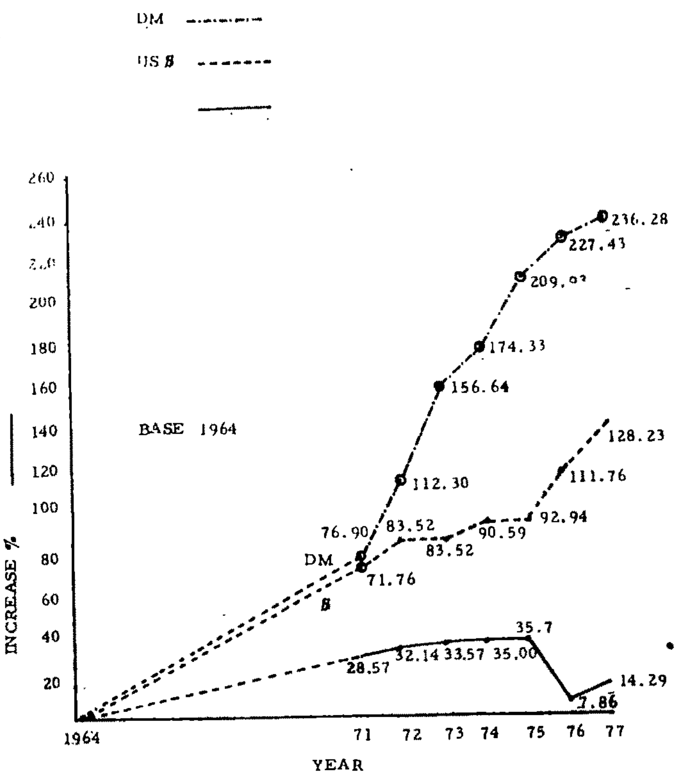
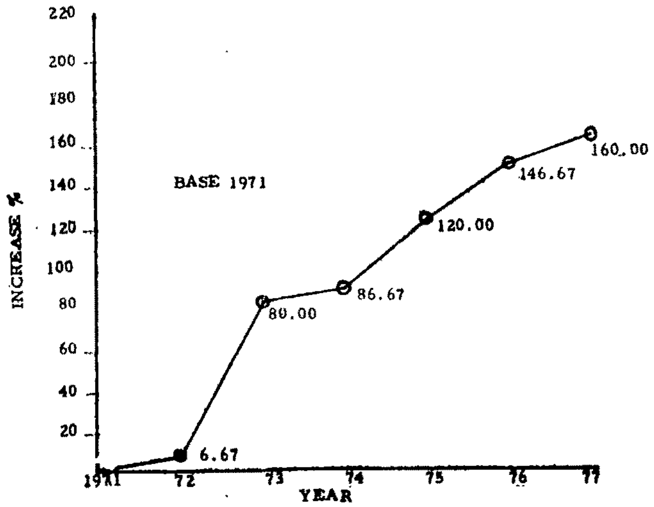


FIG. IV

INCREASING TRENDS OF FOREIGN EXCHANGE CONVERSION RATES

SWISS FRANCE: SF



FOCUS ON UNISIST PROGRAMMES

REORGANISATION OF UNESCO'S INFORMATION PROGRAMMES

The General Conference, at its 19th session, decided to reorganize the activities previously covered by the programme sections "Scientific and technological information and documentation" and "Documentation, libraries and archives".

The implementation of this decision has given rise to changes in the organizational structure inside Unesco. In February 1977, the Director-General created a Division for the General Information Programme, covering the majority of the activities formerly coming under the two above-mentioned sections.

INTERNATIONAL SEMINAR FOR MANAGERS OF LIBRARY AND INFORMATION SERVICES

In the framework of the assistance to Member States in the development of scientific and technical information personnel, an international Seminar on Administration for Managers of Scientific and Technical Library and Information Services was held from 13 to 26 June 1977 in Ankara, Turkey. The Seminar was organized by the Scientific and Technical Research Council of Turkey Documentation Centre (TURDOK) and Unesco/UNISIST.

The conceptual basis of the Seminar was founded on the assumption that the basic knowledge, skills and methods of administration which have been developed in business, industry and public administration are equally important and applicable for those who practise administration in library and information services. One important aspects of the programme was the special attention given to the behavioral aspects of administration.

The Seminar was conducted by a team of instructors from the United States and Turkey under the direction of Prof. P. Wasserman and Prof. J. Rizzo (U.S.A.).

SYMPOSIUM ON THE INTERNATIONAL STANDARDS INFORMATION NETWORK (ISONET), 5-7 October 1977, Paris

For many years national standards organizations have been answering inquiries about national standards and practices. By necessity, they were also required to provide information on international standards and standards from other countries. In an attempt to improve their individual services, an exchange scheme for standards was organized and is still in operation. The need for information continued to grow and the importance of sharing experiences and developing compatible systems to facilitate the interchange of information was acknowledged by ISO and its member bodies as well as by Unesco. With the creationof the International Standards Information Network (ISONET), a very important step has been taken in the direction of an efficient and systematic organization of information transfer.

The Symposium, which was jointly organized by Unesco within its UNISIST programme and the International Organization for Standardization (ISO), was intended to:

1. Expand international understanding of the need and uses of information on standards and its important aspect of technology transfer;

2. Stimulate further cooperation between standards information centres and encourage individuals and relevant organizations to establish links with ISONET either by continuing to and/or by profiting from its services.

NEW UNISIST DOCUMENT: A COURSE IN ADMINISTRATION FOR MANAGERS OF INFORMATION SERVICES - DESIGN, IMPLEMENTATION AND TOPICAL OUTLINE

In response to the increasing demand from Member States, especially from developing areas, for the training of managers and as a follow-up to the suggestion of the UNISIST Ad hoc Committee on Education and Training to develop curriculum

material and guidelines which would help developing countries design and conduct their own courses, Unesco requested Prof. Paul Wasserman, College of Library and Information Services, University of Maryland and Prof. J.R. Rizzo, Department of Management, Western Michigan University, to work out a topical outline for courses in administration for managers of information services and a set of guidelines for designing and implementing such courses. The two UNISIST courses for managers of information systems which they conducted in Mexico and the Philippines respectively served as a basis for preparing this outline which has been issued as a UNISIST document.

The type of course detailed in this document is built upon the assumption that those who hold or will come to hold senior administrative responsibility in information organizations of all types must be reoriented in their outlook from the specific and technical problems of information to the central issue of organizational management if their organizations are to be effectively led.

Copies of the English version are available free of charge from the Division for General Information Programme, Unesco, 7 place de Fontenoy, 75700 Paris, France.

BROAD SYSTEM OF ORDERING - PROGRESS REPORT

The 1975 Progress Report on the BSO, issued on 31 March 1976, revealed that the three-man working group of the International Federation for Documentation (FID/BSO Panel) had completed the following tasks:

designing of a special questionnaire and circulation, together with a first draft BSO schedule (without formal notation) in almost 500 copies to more than 300 addresses, including all ICSU-affiliated and other important organizations;

-- analysis of some 100 questionnaires, showing that about 30 found the first draft "an orderly conspectus of all branches of knowledge -- the remainder being dissatisfied or doubtful, and that although only 14 thought it suitably detailed in their own field, some 40 agreed to carry out voluntary tests;

-- preparation of a 2nd version of the BSO schedule -- taking account of the comments in the returned questionnaires as far as possible, provided with a still provisional but formal notation and submitted with the 1975 Progress Report.

During the summer of 1976 and winter of 1976-77, the FID/BSO was consequently engaged in two major operations--the one in BSO schedule improvement and preparation of an alphabetical subject index, the other in preparation of test instructions and choice of sources for extracting test samples.

1. Important improvements in the 2nd draft BSO schedule (March 1976), which proved to be more extensive than at first expected, have involved the following tasks, all requiring considerable time and effort during the past year:

(a) checking and modifying terminology in specific subject fields;

(b) modifying structure and combinatory facilities for complex subject-fields, including amendment and expansion of the Introduction to the BSO;

(c) tidying up, shortening and generally adjusting the notation - in line with 1(b);

(d) preparing the A/Z subject index, checking and adapting it to the changes required by 1(a),(b) and (c).

2. Preparations for testing the BSO, which also required much thought and discussion by the FID/BSO Panel, have included:

(a) compiling a suitable Test Worksheet (with general explanation of the BSO and detailed instructions for use), designed to show the success/failure ratio given by the extent to which testers can accurately match subject-field terms for some 150 sample items (randomly chosen) with the concepts set out in the BSO schedule;

(b) deciding the make-up of the 150 test items, which will be supplied to each tester in six random samples, each of 25 items.

PLANNING COMMITTEE OF THE INTERNATIONAL CONGRESS ON NATIONAL BIBLIOGRAPHIES - 4th Meeting

The Planning Committee for the International Congress on National Bibliographies had its 4th meeting at Unesco Headquarters in Paris on 15-16 February 1977.

There were two main items on the agenda of this meeting:

1. Examination of the preliminary draft of the working document for the International Congress which had been prepared by the IFLA International Office for UBC. During the discussion of the working document it was repeatedly emphasized that national bibliographic control was not merely a library tool for selecting and acquiring publications but had a far wider purpose in the social and economic development of a country.

2. The organization of the Congress itself. It was agreed that all Congress discussions should take place in plenary sessions, each of which would be devoted to a particular aspect of national bibliographic control.

BOOK REVIEWS

Pralekhan Parichay (Marathi) = Introduction to Documentation, by S G Bhat. Nagpur, Dattsons Publication, 1976. p.19+359. Rs. 18.00 [Reviewed by G R Parkhi]

This is the first book on documentation written in Marathi. Maharashtra Universities Book Production Board, Nagpur has undertaken the task of producing educational literature in the Marathi language. Library science is one of the approved subjects and the present book is an outcome in this scheme.

Almost all the aspects within the purview of documentation have been covered. A systematic treatment of the subject has been presented in 18 chapters, which cover various topics, namely (1) documentation - a new technique; (2) classification and cataloguing; (3) abstracting and indexing; (4) document storage and filing; (5) documentation lists; (6) punched cards, computors and mechanised retrieval of information; (7) translation; (8) reprography; and (9) documentation centres. Marathi equivalents for the documentation terminology in English language, a list of periodicals on documentation and Marathi-English and English-Marathi dictionary have been appended at the end of the book.

The author discusses, first of all, how innumerable documents are being created through primary, secondary and tertiary sources at a tremendous speed, which is responsible for the so called information explosion. He then continues with this explosion to explain how the documentation technique emerged in order to have proper control on this phenomenon. In this context, role of libraries in documentation, emergence of special libraries, bibliographical control, information storage and retrieval, technique of classification (with special reference to UDC and Colon) and cataloguing and so on have been discussed. New techniques of storing information, such as punchcards, magnetic tapes and discs are briefly described. The publication also describes in detail various filing media and the methods of storing special documents like newspapers and their cuttings, pamphlets, reports, standards, patents, drawings, microfilms, microcards, microfiche and so on in a systematic manner so that it may be possible to retrieve them easily without loss of time whenever required.

Imparting quick information is usually effected by bringing out documentation lists, current awareness services, and selective dissemination of information (SDI). These services are available on local, national and international levels. The author has dealt with them in detail with examples of some of the well known services available currently. While talking about various abstracting services, the art of abstracting - its definition, usefulness, kinds of abstracts, writing abstracts, etc. have been covered at length. In this context the methodology of indexing has been described with special reference to coordinate indexing and chain indexing.

Translation and reprography, as feeder services in the field of documentation are dealt with separately. The author, first of all, speaks of language barrier for the scientists in the world. He then outlines the attempts made to overcome the language barrier through translations banks, periodicals giving information on the availability of translations, cover-to-cover translations of foreign language periodicals and so on. The chapter on reprography deals with different methods of copying and duplicating documents with a brief description of various processes involved in the reprographic techniques like reflex copying, photostat process, microphotography, xerography, diazography and thermofax.

Information regarding the activities and various services rendered by some of the important national and international bodies like UNESCO, FID, IFIP, ICSU, ISO, UNISIST, ASLIB, ASIS, VINITI, INSDOC; IASLIC, DRTC, and NSSDC has been included at the end of the book.

The book has been written quite systematically covering most of the aspects of the subject. The thought-content in the book is expressed in such a lucid manner that one is tempted to read the book continuously only to finish it. This clearly shows the author's command over the Marathi language. The Marathi version for the documentation terminology has been found to be appropriate. The book seems to be a useful guide for the degree students of library science from the universities in Maharashtra, irrespective of the medium of instruction. In case, Marathi is introduced as the medium of instruction for the library courses in future in the universities of Maharashtra, the book can be recommended as a text for the subject "Documentation".

The variety of librarianship: essays in honour of John Wallace Metcalfe, ed by W Boyd Raywards, Sydney: Library Association of Australia, 1976. 242p. [Reviewed by B K Sen]

Sir Peter Crisp, the chairman of the Australian Advisory Council on Bibliographical Services and the Tasmanian Library Board, in his foreword to this book, has rightly said "To introduce John Wallace Metcalfe to librarians is a work of pupererogation". An internationally renowned figure in the field of library science, John Wallace Metcalfe is deeply engrossed for well above three decades for not only furthering the cause of librarianship but also for furthering the contribution of libraries and librarianship to knowledge. Library profession in Australia as a whole, Library Association of Australia and Library education in Australia owe, possibly to the greatest extent, to the endless efforts of John Metcalfe, and as such he is rightly called the father of Australian librarianship. His fearless and sometimes ruthless criticism has given rise to controversies all over the world, but he held his views with utter firmness all through.

It is good augury that a Fstschrift has been brought out by the Library Association of Australia as a tribute to the outstanding contribution of John Metcalfe to the profession of librarianship. The Festschrift is a collection of about a dozen well chosen articles contributed by librarians from Australia, U.K., Canada and U.S. Thanks to the editor for the restraints he has exercised in the very neat selection of the articles.

The book starts with two personal notes, one by Russell Doust and the other by W. Boyd Rayward, the editor of the Fetschrift, which throw light not only upon Metcalfe's well known achievements, but also bring out many little known but interesting anecdotes of his life.

'Citation order and linguistic structure' by Derek Austin is an important contribution to the book. Making a brief review of the proposed CRG classification, the author describes the salient features of PRECIS and then discusses various citation orders put forward by Ranganathan, Vickery, Farradane, Coates, and the one followed in PRECIS and the related linguistic structure. There are two contributions on specificity, one by John Balnaves and the other by Elaine Svenonius. Both the papers discuss the meaning of specificity. The former discusses the meaning of specificity, taking account of all such related terms as descriptor, specifier, identifier, etc, whereas the latter depicts the position of Metcalfe in relation to specificity and thereafter describes seven different types of specificity to find a common ground for understanding the concept of specificity. A C Foskett in his article "E J Coates, The British Technology Index and the Theory of Subject Headings; The Man who loved Cat Springing' traces the history of the development of the theory of subject indexing starting from Cutter depicting the 'Concrete. - Process' system of subject indexing devised by J Kaiser as a significant step forward, and highliting the great contribution of Coates in this field. There is also a critical discussion on John Metcalfe's 'Tentative Code', by J. Horner.

E. Wyndham Hulme contributed during 1902-12, five articles in Library Association Record, expressing his ideas on subject classification. Despite their merits, his contribution drew little attention of his contemporaries and successors. John M. Lee in his article on Hulme depicts how Hulme was misunderstood and his ideas were neglected and further shows how some of his ideas are relevant even to-day. The Catalogue of Scientific Papers 1800-1900 brought out in 19 volumes during 1867-1925 by the Royal Society is undeniably a monumental bibliographical work. W Boyd Rayward in his paper on this Cataogue has delved deep into the history of the compilation of this great work and the abortive efforts put forth by the Royal Society to secure a subject access to the Catalogue.

Apart from these, there are four more articles devoted to library associations and certain areas of Australian library development. Another important item of the book is a bibliography of writings on and about John Metcalfe.

In fine, it may be said that the book is a beautiful compilation, comparable to a bouquet of well chosen flowers, the fragrance of which will delight all and sundry in the library profession.

Copyright, information technology, public policy, by Nicholas Henry. New York, Marcel Dekker, 1975-76. 2 pts (152+168p). $ 29. ISBN-0-9248-6329-9 and 0-8247-6406-4:, [Reviewed by B Guha]

With increasing facilities for document copying, librarians and information workers are quite understandably obliged to take an occasional look at the copyright laws. At times, they are obliged to do so by threatening gestures from the publishing houses. Librarians realise that copyright laws are meant to protect the intellectual properties of individuals but at the same time they are concerned with the interests of another group of people who want to make use of the available knowledge in the pursuit of their own intellectual activities.

The present study by Professor Nicholas Henry examines the copyright issue in a very wide perspective. This is a sociological study in which any one involved with research or dissemination of research or those concerned with the relationship between knowledge and power, will be interested. Librarians, educators, publishers, and public administrators will, of course, be interested. The new situation has arisen, according to the author, due to the fantastic development of what he calls 'information technologies', such as, photoduplication, microreproduction, computer-based information systems, cable television, etc. The social, political, and economic impact of these technologies, resulting in 'neopublishing', hitherto poorly understood, is brought into relief by Professor Henry's penetrating study.

Part 1 considers the interrelationships among the new technologies, the information industries and professions, and public policies designed to manage the development and flow of knowledge in techno-scientific cultures. Part 2 mainly recounts the 'politics of neopublishing' to revise the United States copyright law.

Apart from the main theme of the work, there are certain chapters and topics, such as, Knowledge and the polity, Technologies for knowledge, Society technology and knowledge, The politics of neo-publishing, etc, which will be of special interest to librarians and information specialists. The fascinating study will immensely widen their horizon.

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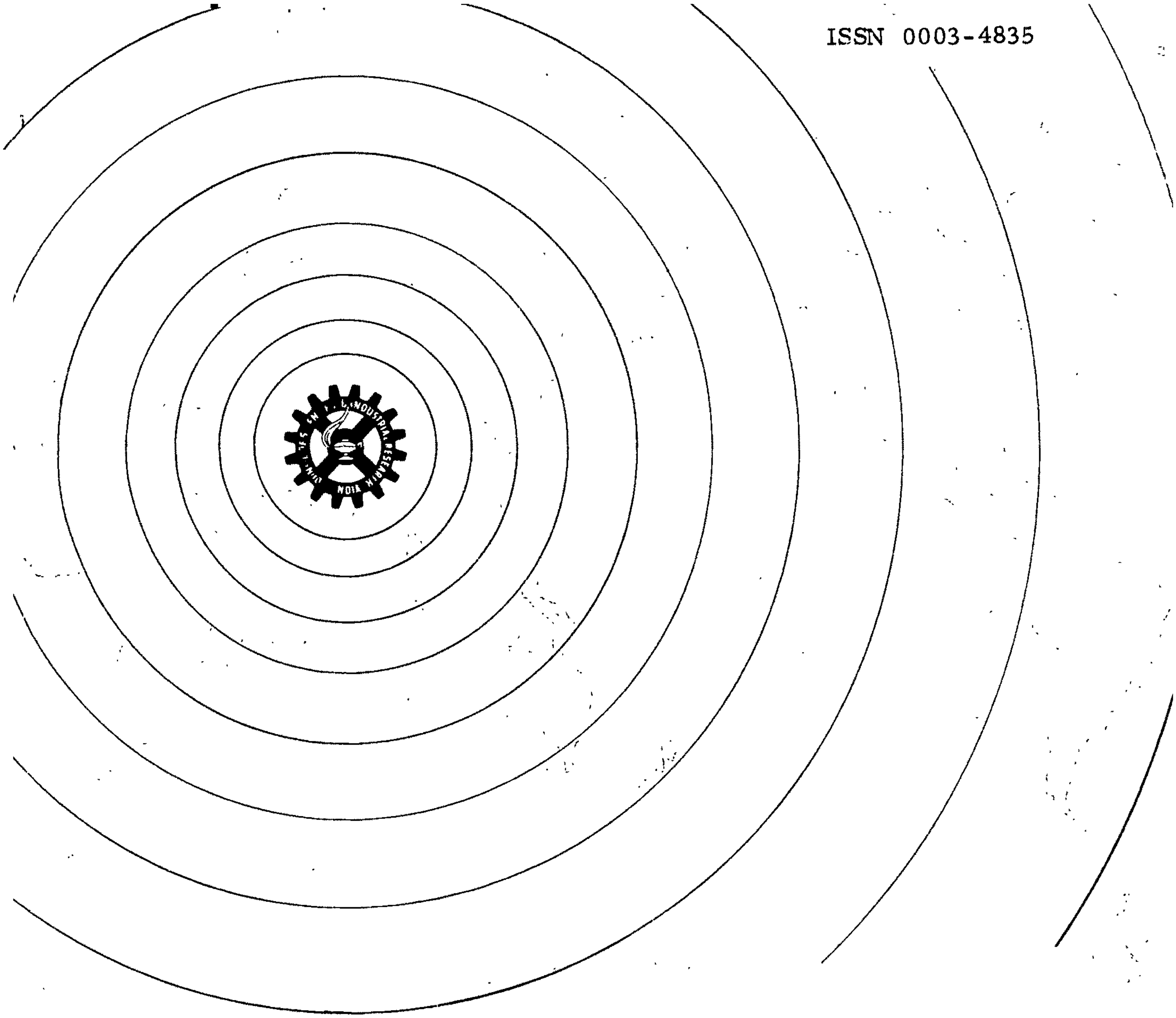

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Emphasizes the role of standards in the development of library services and traces the development of standards for library services in India. It points out how the existing norms do not cover various aspects of library services and also do not help teachers college libraries in in Karnataka or elsewhere in India. Realistic minimum standards for teachers college libraries in Karnataka based on their current situation, immediate need and the resources available, covering the objectives of the library, collection, organization of materials, staff, services, facilities, administration, and budget are formulated and presented. It also discusses the question of financial resources essential to implement the proposed standards and suggests alternate ways of funding.

American Heritage Dictionary of the English Language (1969) defines standard as "An acknowledged measure of comparison for quantitative or qualitative value criterion; norm ... a degree or level of requirement, excellence, or "attainment." The Oxford English Dictionary defines standard as "a definite degree of any quality, viewed as a prescribed object of endeavour or as the measure of what is adequate for some purpose." The introduction to Standards for South African Libraries provides a specific statement on standards for libraries: [1]

> Library standards may be defined as the criteria by which ... library services may be measured and assessed. They are determined by professional librarians in order to attain and maintain the objectives they have set themselves. Standards may be interpreted variously as the pattern of an ideal, a model procedure, a measure for appraisal, a stimulus for future development and improvement and as an instrument to assist decision and action not only by librarians themselves but by laymen concerned indirectly with the institution, planning, and administration of ... library services.

Developing standards for different types of libraries and attempting to attain standards has become an accepted way of upgrading library services, resources, and facilities since the beginning of twentieth century. The movement towards standards for different types of libraries has made great progress in the United States. The American Library Association has felt the need to provide definite guidelines for the preparation of standards and has published the ALA Standards Manual. [2]. The movement for standards has also made headway in other countries, e.g., in Great Britain, Canada and German Federal Republic. Withers has brought together existing standards for various types of libraries in several countries and has suggested a set of standards for library service in developing countries [3].

Leaders of the library profession have acknowledged the impact and usefulness of standards in upgrading library services in general. In the words of Joseph L. Wheeler, "National standards, set forth to contrast with local performance, and adequately publicized, have doubtless done more— more promptly than any other device— to help good administrators improve conditions in public libraries" [4]. Discussing the usefulness of library standards Robert B. Downs observes: "There can be little doubt, however, that the over all effect of standards has been to upgrade libraries, providing standard institutions with yardsticks by which to measure their deficiencies" [5].

Felix E. Hirsh points out how a small number of quantitative standards such as "the library's slice of the general and educational budget of an institution should be a minimum of five per cent for a well established library with an adequate collection," helped "to revolutionize the college and junior college libraries in the last decade" [6].

Standards for Libraries in India

Leaders of Indian librarianship were aware of the important role of standards in the development of libraries in the United States as well as in Great Britain. Some efforts have been made in the country to develop standards for certain types of libraries. S.R. Ranganathan, "the father of library movement" in India has done considerable work in the area of developing standards for libraray service in India. Based on his experience in

[Based on the Doctoral Dissertation, Univ. of Pittsburgh, 1975]

the Madras University Library, he developed a staff formula for professional, non-professional, and unskilled staff in a university library first published in 1948 [7]. The University Education Commission chaired by S. Radhakrishnan (1948) recommended Rs.40 per student as the basis for calculating annual grants to university and college libraries [8]. The University Grants Commission appointed a Committee in 1957 with S.R. Ranganathan as the chairman to advise the Commission with regard to the development of university and college libraries in the country during 1960's. Some of the more important recommendations of the Committee setting forth standards for action are as follows: [9]

1. The entire finance of a university or a college library should be provided by the university grants commission and the state government.
2. The commission should not withdraw or lower its grant to a university or a college library because the state government fails in its obligation and vice-versa.
3. The library grant to a university or a college should be determined according to an agreed per capita formula. For the time being the formula may be at the rate of Rs.15.00 per student and Rs.200.00 per teacher and research fellow. There should also be a specific initial library grant in case of a new university and of a new department in an existing university.
4. The status and the salary scale of the library staff should be the same as that of the teaching and research staff [10].

A Committee consisting of librarians, architects, engineers and furniture makers with S.R. Ranganathan as chairman has recommended standards for university library buildings, fittings and furniture [11]. However, its impact has been negligible and Ranganathan observes: [12] "Unfortunately, the University Grants Commission does not appear to enforce the standard. The universities too seem to be indifferent to it or even unaware of it."

Ranganathan has also recommended two models based on per capita expenditure approach for the development of college libraries [13]. Both models consider a typical college with an enrollment of 1,000 students (900 undergraduates and 100 graduates) and 100 teachers. Model 1, suggests Rs.100,000/- as the annual library budget including the annual book fund, staff salary, and other expenditure. It would mean an annual library expenditure of Rs.100 per student. This model takes into consideration the book fund at the rate of Rs.20 per student and Rs.300 per teacher, i.e., in other words Rs.50 per student.

Model 2, projects the annual book fund for a similar college library as Rs.32 per student during the year 1970-71, and on this basis the total library budget has been worked out as Rs.64 per annum. The projection has been worked out on the basis of annual book fund of a college which was Rs.17 per student during 1960-61.

The Education Commission (1964-66) observes: [14]

> No new university, college or department should be set up without taking into account its library needs in terms of staff, books, journals, space etc. Nothing could be more damaging to a growing department than to neglect its library or to give it a low priority.

The Education Commission suggests "6.5 per cent to 10 per cent" of the educational budget depending on the stage of the institution for the development of each university library. It also suggests as a norm the spending of Rs.25 for each student registered and Rs.300 per teacher per year [15]. However, the Education Commission has not made any specific suggestion for a college library. It may be a safe assumption that the Commission wanted this norm to be observed in case of college libraries also.

N.K. Goil has presented a model for the development of college libraries [16].

1. A college having less than 500 students on its roll must spend about 12 per cent of its total budget on its library.
2. A college with more than 500 but less than 1500 students on its roll may spend about 10 per cent of its total budgeted expenditure on its library.
3. A college with 1500 or more students on its roll may spend about 8 per cent of its total budgeted expenditure on its library.
4. A constituent college in the university campus may spend about 6 per cent of its total budgeted expenditure on its library.
5. A professional college such as medicine/engineering/technology and agriculture may spend about 5 to 7 per cent of its total budgeted expenditure on its library.
6. As regards the division of the total library fund into (a) books and periodicals, (b) binding, (c) staff, (d) equipment and other accessories, this may be worked out as (a) 40 per cent, (b) 5 per cent, (c) 50 per cent, and (d) 5 per cent with occasional

> marginal adjustments. Items of equipment such as book-racks, furniture etc., have to be treated as capital expenditure, for which ad hoc special grants should be provided.

Goil's model takes into consideration college libraries which have to serve less than 500 students, suggests a norm of expenditure in case of professional colleges such as engineering. It also recognizes the case of a college located on a university campus with access to the university libraries. Further, Goil also suggests a division of library budget under various heads of expenditure.

Librarians in Karnataka are aware of the role of standards in the upgrading of library services. The First Mysore State Conference of College and University Librarians held in Bangalore during February 23-25, 1973 discussed the question of formulating standards for college libraries in the state and felt that the state library association should evolve a set of standards for the local college and university libraries after examining library standards formulated in India and abroad [17]. The Conference also passed a resolution urging the University Grants Commission and/or granting authorities "to insist upon the college to spend a minimum of 10 per cent of their total budget for the development of the college library" [18].

In spite of several attempts, India does not yet have a set of standards for college libraries covering important aspects: objectives, collection, organization of materials, staff, services, administration, facilities, and budget. The norms suggested time and again have only covered the budget and status of the librarians. Further, the basis of formulating these norms is not very clear. It is difficult to know whether they were developed on the basis of practice prevailing in libraries or were prompted by similar guidelines in vogue in other countries. Except in the case of the norms suggested by the University Grants Commission Library Committee (1959) no other norms appear to have been a product of consultation with librarians, educators, administrators and other interest groups. Further, as Goil observes, [19] "we are not in a position to state whether any model is being followed in regard to the development of our college libraries."

The working group appointed by the Education Commission in collaboration with the National Association of Teacher Educators to recommend a model syllabus for the B.Ed. degree program, recommended the fulfillment of certain basic requirements for a post-graduate secondary college of education and observes: [20]

> Colleges which offer the B.Ed. degree course should have at least 5,000 volumes covering the various sections and should maintain a separate section with a number of copies of the more frequently used books A recurring amount of Rs. 3,000 per year should be provided to every College of Education for books, journals, periodicals and school textbooks.

Indian universities which affiliate colleges, state governments which provide grant-in-aid to affiliated colleges by and large have not "recognized" the norms of library service suggested by various bodies and persons as revealed by the requirements laid down by the universities and the state governments for the purpose of granting affiliation or grant-in-aid. They do not seem to attach much importance to the suggested norms as they had no part in their framing. Further, professional associations on a national or state level have not so far bestowed thought on developing standards for library service, and the suggested norms lack the authority of a professional association. In fact, no one including the Library Committee appointed by the University Grants Commission has described their recommendations as "standards". The word seems to have been carefully avoided in preference to terms such as "norms", "recommendations," and "suggestions." In spite of lack of unified coherent effort at the evolution of standards for any type of library in India, the recommendations of the University Grants Commission Library Committee has resulted in great improvement of university libraries in India, thus proving the decisive advantage of the formulation of standards for library service.

The models suggested by Ranganathan apply to colleges with an enrollment of 1000 students with 100 teachers. Although Goil takes note of the colleges with less than 500 students, probably he was not really thinking of colleges with an enrollment between 100 to 200 students. The University Grants Commission Library Committee also does not appear to consider colleges with enrollments between 100 to 200 students. Further, all norms published so far consider colleges which have four year degree programs with or without limited postgraduate courses. That is why none of them is applicable to Teachers College libraries in Karnataka. The Teachers Colleges offer academic programs of one year duration and have an enrollment between 100 to 200 students. They offer a graduate program. They prepare secondary school teachers who will spend a life time in teaching the boys and girls of the country. It is important that they should see a good library in operation, experience the benefits of modern library service, so that they could promote the "library idea" during their career as teachers at various secondary schools. There is a paramount need for the formulation of standards for Teachers College Libraries in Karnataka, which take into consideration the existing situation of these institutions, the thinking of leaders in the field and the future possibilities in terms of resources available. In order to formulate such standards the investigator invited suggestions from twenty-five persons including librarians, library educators, professors of education, administrators of teachers college and teacher educators. Twenty-three out of twenty-five are located in the state of Karnataka. They were provided with an information sheet giving summary details of standards for the development of Colleges of Education Libraries in Britain. In the light of the information provided they were requested to suggest standards for Teachers College Libraries in Karnataka. It was also pointed out that the B.Ed. program in Britain is a four year degree program while B.Ed. program in Karnataka is one academic year program. Eight persons responded (32 per cent). Suggestions were requested under four headings: (1) collection, (2) staff, (3) finance, and (4) area of accommodation. One respondent said that "these are technical matters" requiring suggestions from "a professionally qualified person," and did not suggest any thing. Some provided suggestions under one or two headings and left the other sections. The data received are tabulated below. Table 1 gives details of suggested standards concerning library collection.

Five respondents indicated the number of volumes to be added to the library in terms of the number of students and teachers:

1. 2 books per student per year
2. 5 books per student per year
3. 3 to 5 books per year per students
4. 10 books per student per year
5. 20 books per teacher per year

The range of books in Education recommended for a teachers college library collection varies from 5,000 to 25,000 volumes. Only one person considers the question of books in subject other than Education. One thousand to seven thousand five hundred secondary school text books collection is recommended. There is a consensus of opinion concerning the number of periodical titles a teachers college library should subscribe and all have recommended fifty periodical titles for a teachers college library. One person suggests the number of periodical titles in education and in other subjects to be subscribed.

Table 2 provides details of suggested standards concerning library staff.

Only one respondent considers the question of professional qualification and recommends a degree or diploma in Library Science. Three persons recommend a full time professional librarian while one person recommends an assistant librarian, as the head of the teachers college library. All of them recognize the need for an attender or peon. The total number of employees recommended varies from two to four. Suggested Standards for financing teachers college libraries are presented in Table 3.

TABLE 1

RESPONDENTS SUGGESTIONS FOR STANDARDS: COLLECTION: TEACHERS COLLEGE LIBRARIES, STATE OF KARNATAKA, INDIA

Response number	Books in education	General books	Secondary School text books	Total number of periodical titles	Periodical titles in education	Periodical titles in other fields
1	5,000	-	1,000	50	30	20
2	20,000	-	all texts in all languages used	-	-	-
3	25,000	-	7,500	-	-	-
4	15,000	-	5,000	50	-	-
5	5,000	5,000	-	-	-	-
6	10,000	-	2,000	50 including 1 or 2 indexing/abstracting periodical titles	-	-

TABLE 2

RESPONDENTS SUGGESTIONS FOR STANDARDS: STAFF: TEACHERS COLLEGE LIBRARIES
STATE OF KARNATAKA, INDIA
(for a college with 100 students and 10 teachers)

Response number	Professional staff	Qualification	Clerical staff	Attender*/Peon	Total	Remarks
1	1 librarian	Graduate + degree or diploma in library science prefer candidate with B.Ed. degree	-	1 attender	2	-
2	1 librarian 1 assistant librarian	Graduate	-	1 attender	3	-
3	1 librarian 2 assistant librarian		-	1 attender	4	for a college with 200 students Rs. 20, 000/- library budget
4	1 assistant librarian		1 typist 1 counter assistant	1 peon*	4	

*An attender is literate while a peon is not

TABLE 3

Respondents Suggestions for Finance: Teachers College Libraries in the State of Karnataka, India

response number	suggested basis for calculating library budget
1	Rs.50 per student per year
2	Rs.100 per student per year Rs.200 per teacher per year + 15 per cent for binding, replacement etc.
3	Rs.50 per student per year Rs.200 per teacher per year + 10 per cent for binding etc.
4	Rs.100, 000 initial block grant for building collection Rs. 100 per student per year Rs. 200 per teacher per year (10 per cent of book fund; 20 per cent of periodicals fund for binding and replacement, 5 per cent of total library fund for other expenses).

One of the respondents recommends an initial block grant of Rs. 100, 000/- for building collection over and above annual library grants. Three respondents suggest the provision of a higher amount for teachers than students. Two respondents recommend Rs.50 per student per year while two recommend Rs. 100 per student per year. Suggested standards concerning physical space requirements of teachers college libraries in Karnataka are presented in Table 4.

TABLE 4

Respondents Suggestions for Accommodation: Teachers College Libraries in the State of Karnataka, India

Number of response	Space required	
1	50 x 20 = 1, 000 sq.ft. 20 x 20 = 400 sq.ft.	one hall one room 1, 400 sq.ft.
2	1, 200 sq.ft.	

Four respondents said that the British standards for Colleges of Education may be followed

Proposed Standards for Teachers College Libraries in the State of Karnataka

Standards can be qualitative or quantitative or include both characteristics. The importance and utility of quantitative element in the formulation of standards for library service in any part of the world can not be ignored. Administrators do want to know facts and figures. The College and Research Division of the Pennsylvania Library Association commenting on "Standards/Guidelines for academic libraries" recently observed: [21].

> While there was no objection to including philosophical statements, it was felt that quantitative standards are essential if the document is to be meaningful.

Teachers College libraries in the State of Karnataka are in their infancy and do need quantitative guidance along with the qualitative approach in the formulation of standards for library service. Further, standards may be of two types. Those aiming at ideal goals might be purely theoretical and may be far from reality of the situation. The other type of standards might aspire to the highest attainable goals under a given set of circumstances. The earliest American standards for Library Schools have been called "down-to-earth" standards [22] since they were not based on idealism but the existing situation under which they were formulated. However, even such "down-to-earth" standards greatly contributed to setting the stage for the coming of higher standards. The proposed standards set the highest attainable goals. Even though such goals may not seem high enough from a theoretical point of view, they are formulated with the conviction that even they would bring about the improvement necessary to anticipate higher goals.

The investigator collected information regarding the current status of teachers college libraries in Karnataka through a questionnaire in two parts, part I to be completed by the principals of teachers colleges in Karnataka and part II by librarians or in charge librarians of teachers colleges in Karnataka. The teachers college libraries are found inadequate in their collections, staff, services, facilities and budget*. The investigator also visited several teachers colleges in Karnataka and interviewed the principals, faculty, librarians and students.

The principals and librarians of the teachers college libraries,the investigator interviewed,were certainly interested in the formulation of standards for teachers college libraries in the State of Karnataka and felt that it may help to improve the situation. However, they were rather doubtful of securing financial support required to upgrade the libraries and their services. The investigator invited selected librarians, library educators, teacher educators and representatives of professional associations, mostly in the state of Karnataka to suggest standards for teachers colleges in Karnataka. An information sheet giving the summary details of standards for the development of Colleges of Education libraries in Britain was provided to them. Tables 1, 2, 3 and 4 give details of respondents suggestion for standards. The proposed standards take into account the objectives of teachers college libraries in the state of Karnataka as identified by the principals and librarians of twenty-two out of twenty-four teachers colleges; the suggestions by experts in the field; the existing Indian Standards such as IS: 1172-1957 code of Basic Requirements for Water Supply and Sanitation and financial resources. They are based on the investigator's judgment and hence are subjective.

Standards

1. Objectives of the Library

   1.1 to support the instructional program of the teachers college providing different types of materials and services.

   1.2 to promote reading habits of students and teachers of the college.

   1.3 to provide for recreational reading of the students and teachers of the college.

The primary objective of the library is to provide books, periodicals, maps, charts etc., that are essential for supporting the instructional program of the college. The library should not ignore the important need of providing materials in the subjects not taught in the college to some extent and the need to provide for recreational reading to a limited extent keeping in mind the kinds of libraries and services available to its patrons in the given area. The staff of the library in consultation with the faculty, the students and the administrative staff should develop a statement of objectives in accord with the goals and purposes of its parent institution which should be reviewed periodically and revised if necessary.

2. Collection

   2.1 The teachers college library shall have a basic collection of 10,000 volumes of which 4,000 volumes shall be in Education covering the various courses taught in the college; 4,000 volumes shall be in humanities, science and technology as well as in social sciences excluding education; 1,000 volumes covering childrens and young adult literature; 750 secondary school text books and a reference collection of a minimum of 250 volumes with emphasis on resources in education.

   2.2 The library shall acquire two books per student per year and five books per teacher per year.

2.3 The library shall provide fifty periodical titles one half of which shall be in the field of education and the other half representing other disciplines and general nature.

2.4 The library shall provide maps and charts required for instructional purposes.

2.5 The library shall pay particular attention to materials produced in Karnataka either in English or in Kannada in its acquisition program.

Although a basic collection of 15,000 to 25,000 volumes for a teachers college library is suggested, the investigator is compelled to consider them idealistic under the present circumstances when educational institutions in the state as elsewhere in the country and abroad are experiencing financial difficulties and facing budget cuts. It may also be noted that only six teachers college libraries out of twenty-four have a collection of over 10,000 volumes; seven out of twenty-three teachers college libraries have less than 1,000 volumes in English; seven have a reference collection of less than 200 volumes out of twenty-one teachers college libraries; and only three libraries have over 1,000 volumes in their secondary school text book collection, and only two libraries subscribe to fifty or more periodical titles*.

Further, the Regional College of Education, Mysore, which is treated as a teacher college has a budget of over two million rupees per year, is in a class by itself and not to be compared with other institutions in the state. In the light of the present situation of teachers college libraries, the demands made by this standard are the highest possible and if achieved by the turn of this decade, will certainly set the stage for further improvement. A.C. Devegowda, President of Karnataka Library Association, a teacher educator and special officer to the Government of Karnataka with a mandate to recommend steps for improving the quality of education in the state considers a limit of 6,000 volumes for a teachers college library as reasonable and felt that three years time should be given to the institutions to reach that standard [23]. Adjustments in the number of reference books, secondary school text books, childrens and young adult books may be made to suite the requirements of a teachers college library as long as a total collection of 10,000 volumes is maintained.

The library staff in co-operation with the faculty and students should evolve book selection policies. Great stress is to be placed on the quality of books and should not allow themselves to be carried away by quantity. "Quality and quantity are separable only in theory; it is not possible to have quality without quantity defined in relation to the purposes of the institution [24]. Reviews and scholarly journals, bibliographies, basic lists if any in the subject areas should be consulted in selection of books. The library collection should continually be evaluated for its strengths and weaknesses in relation to the instructional program. Out dated books should be weeded.

The periodical has become the common medium for scholarly communication and generally represents more recent information than in books. Important periodicals in the field of education should be subscribed and the library should get an indexing/abstracting journal most useful to its patrons.

3. Organization of Materials

3.1 Library collections shall be organized by nationally approved conventions and arranged for efficient retrieval at time of need.

3.2 The catalog of the library's holdings shall include all items regardless of format by author, title, and subject.

3.3 The catalog shall be in a format that can be consulted by a number of people concurrently and at time of need.

3.4 Library materials shall be arranged on the shelves by subject except for certain categories of materials which are for convenience kept separate by form.

3.5 Patrons shall have direct access to library materials on the shelves.

Acquisition of materials is only part of the library's effort to provide access to them. Materials acquired have to be classified according to an accepted classification scheme, cataloged and arranged systematically so that they are easily accessible. There should be a catalog which includes all the items a library has and acts as a "key" to the library's holdings. It should always be available for consultation to the patrons. If a library decides to have a book catalog, steps should be taken to keep it up-to-date and multiple copies of the catalog should be provided for the use of patrons.

Teachers College libraries should initiate efforts at the creation of a union catalog of the holdings of all teachers college libraries in Karnataka which should be made available to patrons for consultation in each individual library. This indeed is a prerequisite to promote interlibrary loans among teachers college libraries. As a first step, teachers college libraries in Bangalore and Mysore cities should try to prepare union catalogs of their holdings.

Materials should be arranged on the shelves by subject so that related information can be consulted together. Some types of materials such as maps and charts may be separately kept. Works of reference and text books may be kept separately to facilitate access to them. The bulk of collection with the exceptions mentioned above should be classified and shelved by subject in open stack areas to permit and encourage browsing. The library should adopt open access system with built in safeguards and provide the readers direct access to its collection. A large number of students come from economically backward classes and can not afford to buy text books. The library should make special efforts to provide a text book collection with multiple copies for the use of students.

4. Staff

4.1 There shall be professional librarian on the staff of every teachers college library irrespective of its size.

4.2 The professional librarian shall be a graduate with a Bachelor's degree in Library Science. (preference may be given to candidates with a Bachelor's degree in Education in addition to the requirements mentioned above)

4.2.1 The professional librarian shall have the status and salary of a member of the teaching staff.

4.3 There shall be a clerk on the staff of every teachers college library irrespective of its size.

4.3.1 The clerk should have the same qualifications and salary prescribed for the post in the college.

4.3.2 The clerk should be able to type.

4.4 There shall be an attender on the staff of every teachers college library irrespective of its size.

4.4.1 The qualifications and service conditions of the attender shall be the same as those prescribed for similar posts in the college.

Library collection and facilities by themselves do not form a library. The investment made on them will give no return and there will be no "library" in the true sense of the term unless the library materials are put to constant, active use by every teacher and every student in the college, each in his own measure, and in his own specific subject of interest. This will not happen without a competent library staff. Commenting on the importance of a competent library staff the University Grants Commission Library Committee observes: (25)

> Books are after all artificial entities. It is not natural for a student to pick up ideas and information through recorded phonetic symbols. He is accustomed to pick them up through hearing from a person. He needs to be persuaded to use books. More over there are books of varying standards on one and the same subject. If he lands on a book of wrong standard for him, he would fight shy of reading. There are other unavoidable artificialities in a library catalog, the arrangement of the books in the stack room, and the very rules of the library. All these may scare away a student. If something is not done to help the student to look behind and beyond all these artificialities, the potentially great plenty in the holdings of the library and the potentially greater plenty of readers in the student population would be nothing more than a mockery. Indeed the problem in libraries is no longer one of scarcity in any sense, except the scarcity in the human converters who can help the conversion of the potential thought energy stored in books into the kinetic energy of use by students.

The work of a librarian is a professional job and only a professionally trained librarian can do it satisfactorily. A library staff adequate in quality and sufficient in quantity is a basic requirement for the successful functioning of any library. The professional librarian should have the status, pay scale and other service conditions as that of a lecturer in the teachers college. There should also be provision for the appointment of an Assistant Librarian when the collection exceeds 10, 000 volumes in the scale of an Assistant Lecturer. An acceptance of this standard will result in having qualified librarians and will eliminate the present situation of clerks and faculty members with no training in library science or experience in library work being in charge of teachers college libraries. It will also result in providing a pay scale similar to that of the faculty to the librarians of teachers colleges which only four teachers college librarians are getting at the present time. It will provide much needed support staff which a majority of teachers colleges do not have.

5. Services

5.1 The library shall provide continuing instruction to patrons in the effective use of the library.

5.2 The library shall prepare a library handbook giving details of the rules, resources, services and staff of the library and make it available to patrons free of cost or at nominal cost.

5.3 The library shall circulate materials to eligible patrons under equitable policies.

5.4 The library shall provide indexing services covering the professional periodicals received in the library.

5.5 The library shall provide short bibliographies on specific topics to all its patrons on request.

5.6 The library shall display newly received books in an appropriate place and shall arrange book exhibits on different themes appropriate to a given occasion in an effort to bring its resources to the notice of its patrons.

5.7 The library shall provide reference service to its patrons.

5.8 The library shall establish contacts with other teachers college libraries in the state and the university library in its area and promote interlibrary co-operation and inter-library loans.

5.9 The library shall provide photo copying service in co-operation with the university library in its area.

5.10 The library shall be open for at least eight hours a day at hours convenient for use by a majority of its patrons.

5.11 The library shall be open for four hours a day at hours convenient for use by a majority of its patrons on Sundays and holidays.

The teachers college library should provide instruction in the use of books and libraries to its patrons so essential to enable them to find their way about the literature of their subjects. This will help them while they are studying at the college and will serve them throughout their professional career as teachers. The library shall provide its patrons with ready reference information, such as statistics or addresses and information and special material about the locality and environments in which teaching practice takes place. It shall make every effort to answer question received by patrons. The library staff can demonstrate their usefulness to the college community by providing indexing services, bibliographic services and arranging book exhibits. These activities will help the patrons and the library will become a live institution full of activity. The library should establish co-operative relationship with other teachers college libraries in the state and the university library of its area and act as a link with the world of books and libraries outside, being ready to draw upon the special resources of many other institutions and to make its own contribution to the various co-operative schemes. The period of book loan should be determined on the basis of local conditions such as the number of patrons, the number of copies available etc.

6. Facilities

6.1 The college shall provide 2, 000 square feet area for housing the library.

6.2 This space consist of a hall and one or two rooms.

6.3 The area provided should be centrally located in the college and easily accessible to the students and teachers of the college.

6.4 The hall and the room to be provided should be the best available in the college in terms light and air.

6.5 The library should have access to toilet facilities for males and females.

6.6 There shall be provision for drinking water in or near the library.

6.7 The library shall provide seating accomodation to one third of its students and one third of its teachers.

The standard is recommended for a teachers college with 100 students and 10 teachers with a collection of 10, 000 volumes on the following basis:

seating for 35 persons at 25 sq. ft.	870	sq. ft.
2 carrels at 35 sq. ft.	70	sq. ft.
four fifths total (i.e. 8, 000) books at 75 sq. ft. per 1, 000	600	sq. ft.
one fifth total (i.e. 2, 000) books at 55 sq. ft. per 1, 000	110	sq. ft.
entrance counter, catalog and display	145	sq. ft.
library staff work area for two at 100 ft. per person	200	sq. ft.
	2, 000	sq. ft.

(Suitable adjustments for the convenience of the library should be made). Standards recommended for Colleges of Education Libraries in Great Britain are followed in case of providing reading space and shelf space (Appendix B). At present as many as eleven teachers college libraries are housed in a space less than 800 square feet.

Successful library service presupposes an adequate library building. The physical atmosphere of the library should be inviting. There should be provision for enough light and air in the library. It should be centrally located in the college. Thirty-six per cent of teachers colleges in Karnataka do not have their own building. It is possible they are planning to build one. Attempts should be made to build the library area of the college building in consulatation with the librarian, construction engineer and the principal of the college.

The University Grants Commission Library Committee has recommended a seating accomodation for one fifth of the total number of students and one tenth of the number of teachers in a college library as a norm to be followed. (26) However, there is a need for providing seating accomodation for one third of the total number of students and one third of the total number of teachers in teachers college libraries as the college consists of a one year course and at times students and teachers work together in the library according to the timetable. The University Grants Commission Library Committee recommends the provision of the following rooms for a college library with 5, 000 to 50, 000 volumes: stack-room, catalog room, general reading room, periodicals room, group study room, seminar room, librarian's room, technical staff room, administrative staff room, display space at entrance, and microfilm reading room [27]. Although such provision is highly desirable, the circumstances under which the teachers colleges are functioning convince the investigator that is is not in the world of possible achievement and hence it is not recommended. The patrons of the library should have access to toilet facilities and there should be provision for drinking water. IS: 1172-1957 Code of Basic Requirements for Water Supply and Sanitation may be accepted as a guideline for providing such facilities.

7. Administration

7.1 The librarian shall be directly responsible to the principal of the teachers college.

7.2 The librarian shall be a member of the college council with voting power.

7.3 There shall be a library committee consisting of the principal, respresentatives of the faculty and the students with the librarian as the member secretary.

7.4 The library committee shall function in an advisory capacity and shall meet at least twice an academic year.

7.5 The library shall prepare an annual report explaining the work of the library during the year and presenting its plans for the coming year.

7.6 The college should condone a loss of up to four books for every thousand books circulated as reasonable loss and should not hold the library staff responsible for such loss.

7.7 Statistics useful to study the use made of the library and to see how far the library measures up to standards for making valid comparisons should be collected on a continuing basis.

The librarian should be treated as an officer of the college with full authority of administering the library under the direct supervision of the highest executive officer of the college i.e., the principal. The library should not be isolated and should be in touch with the faculty and the students to know their needs, to feel their reaction to library services and to positively respond to their demands. The library committee will provide formal basis and serve as a meeting ground for the library and its patrons and makes meaningful dialogue possible. The annual report of the library lets patrons know of the activities of the library and the possible direction of its growth for mutual advantage.

The practice of holding the librarian and his staff responsible for the loss of library materials has done great harm to the provision of library service in India. It encourages the "custodian" function of the librarian at the cost of hindering use of the library. Commenting on this practice S.R. Ranganathan observes: [28]

> The practice of making librarians pay for the malpractices of readers originated in the days of manuscript libraries. For, each volume was then unique and was regarded as property. Even after printing came into vogue, making copies of a book cheap and plentiful, this practice continued for a few centuries.
>
> But today the preservation function and service function have been separated out. In each, country, a special national storage library is to be kept for preservation purposes. All other libraries are to be made service libraries charged with the duty of making every citizen able to use books and of putting every book in continuous circulation until it is worn out or outmoded in thought. This is to be done at any cost, even at the risk of losing some books. ..... The books in a service library are now regarded as expendable commodities. In the present day practice, writing-off one volume for every 1, 000 volumes sent out on circulation has become quite common... The medieval practice is more common today in India than in other developed countries... This must stop. I trust that a better ethics in the library profession will take shape and that public opinion will get educated very early to stop this anachronism.

It is time that this obnoxious practice is given up and certain amount of loss, tear and wear of library materials is accepted as natural and inevitable . This practice has been the cause of closed access in many libraries even today. While it is essential to have "open access" with safeguards, it is undesirable and unjust to hold the library staff responsible for minimal loss of materials. Condoning the loss of four items per thousand books circulated was recommended by the Indian Library Association Conference at Tirupati, in 1969 and by the First Mysore State Conference of College and University Librarians held during 23-25 February, 1973 in Bangalore, Karnataka. (29)

8. Budget

8.1 The library shall have a minimum annual book budget of Rs.10,000/- which shall be spent on purchase of books, subscriptions to periodicals, binding and other expenses in the following ratio 7:2:1

8.2 The salaries of the library staff should be paid out of the total college budget.

The library shall acquire two books per student per year and five books per teacher per year. (250 volumes for a college with 100 students and 10 teachers) The same may be followed when the enrollment or the number of teachers increases. The proportion of books in different categories shall be as follows: Books in Education, 100; Books in other disciplines 100; secondary school text books and children's and young adult books 50. (However, a library can alter the proportion to suit its requirements) The average cost of a general book is around Rs. 25 per volume, that of a book in education is around Rs.40 and a secondary school text/children/young adult book is Rs.10. Thus acquiring 250 books would cost Rs.7,000.

The average cost of subscription for a periodical in the field of education published in India is around Rs.10 a year; while one published abroad is around Rs.75 to Rs.100 a year. Periodicals in other fields published in India could cost Rs.20 or more. The library shall subscribe to twenty periodicals in education published in India five selected foreign periodicals and the rest to be chosen to suit the specific requirements of the college. An indexing/abstracting journal should be included.

Generally libraries get a 10 per cent discount on their book purchases from book sellers. No discount is allowed on certain items. The accrued discount amount may be utilized to buy multiple copies of often used books or to purchase reference books or to buy maps and charts. Marginal adjustments in the pattern of spending to suite local needs should be made.

Sources of the Budget

The University Grants Commission Library Committee suggests that an academic library should receive grants at the rate of Rs.15/- per student and Rs.200/- per teach [30]. In case of typical teachers college with 100 students and ten teachers, this would mean, Rs.1,500 + 2,000 = Rs.3,500. This formula works well in case of Arts, Science, and Commerce Colleges with enrollments over 1,000 students and a faculty of fifty teachers or more. The various other recommendations based on a per capita approach similarly fail to be of real use to a teachers college library. Goil considers the case of a college with less than 500 students and recommends 12 per cent of the college budget for the library. As the budget of a considerable number of teachers college libraries in the state is between Rs.100,000 - 150,000; 12 per cent of it would be Rs.12,000 - 18,000. This is not enough to cover the book fund as well as the payment of salaries to the library staff. The various suggestions put forward in this regard are not of practical help to the teachers college libraries.

As it is, the grant-in-aid code of the Karnataka State Government has a provision for the appointment of a librarian, one attender for the library irrespective of the size of the library, and a library clerk if the number of volumes in the library exceed 10,000 [31]. The investigator recommends the removal of the clause prescribing the number of volumes for the provision of a library clerk. If that is accepted by the state government, the teachers college libraries in the state are assured of the services of a staff recommended under standard 4, the cost of which will be met by annual grant-in-aid by the state government. The state government should also accept the various recommendations with regard to the qualifications and status of the library staff.

The grant-in-aid code should be further amended to reflect the state's realization of the importance of the library in the teachers college and its determination to improve the present situation by taking some positive steps. At present the requirements of the library such as books, journals, maps, charts, shelves for books are included under the "equipment grant". The equipment grant which is to be spent on several things besides the ones mentioned above for the first year to a teachers college is Rs.5,000/- and there after Rs.2,500/- per year. This shows the low priority given to the library and should be changed. The grant-in-aid code should provide a separate head for library and should provide Rs.10,000 book fund per year to a teachers college with 100 students and ten teachers. Rs.100/- additional annual grant for every additional student and teacher should be provided.

The state government should not provide building grants to any teachers college for a new or old building which does not follow standard 6. By doing so, the government will be giving the library a recognition which is its due and which will create the environment so essential for its effective functioning.

The Study Group on the Education of Secondary Teachers in India, of the All India Association of Training Colleges in India commenting on the need for state support for teacher education emphasizes the need to make teacher education completely free and urges the central and state governments to meet the entire cost of teacher education [32].

If the state strongly feels it can not provide the kind of aid recommended here for some reason or other the investigator suggests an alternative. The teachers college under the present grant-in-aid code is permitted to collect library and reading room fees from the students. But the amount so collected is treated as a source of income to the college which affects the grants to the college. As a result nearly half the colleges do not collect a fee inspite of provision for it. The state should not consider the library and reading room fee as a source of income to the college for the purposes of calculating grants, but should insist on the spending of the amount for the purpose for which it is collected. The colleges may collect Rs.50/- from every student per year as library and reading room fee which amounts to Rs. 5,000/- in case of a college with 100 students. The state may provide an equal amount as a matching grant. Further the present provision in the grant-in-aid code equipment grant should be used for providing benches, tables, chairs, shelves, black boards, vessels, almiras etc., which are needed by the college including the library.

The state government should in cooperation with the University Grants Commission make arrangements to provide a one time block grant of Rs.100,000 to each of the teachers college libraries in the state so that the libraries shall make up their deficiencies and acquire a basic collection. The University Grants Commission Review Committee on Education recommends a minimum grant of Rs.50,000 phased over a period of five years to provide a basic collection for teachers college libraries [33]. The colleges should be allowed a minimum of three years to spend the amount. Several librarians and principals of teachers colleges have pointed out the difficulties and delays of acquiring books [34]. Extra time should be given to acquire what is needed. Further, there should be provision to spend one tenth of the grant amount for hiring temporary staff to work in connection with acquisition and organization of materials under this scheme. The University Education Commission (1948-1949) commenting on acquisition of books and the financial resources of academic libraries observes: [35]

> As it will not be possible for a library to purchase the increasing number of good publications which come out year after year out of its fixed allotment, a special non-recurring grant should be made once in five years to cope with the arrears of books and journals.

This recommendation of the University Education Commission is worthy of consideration and implementation. These measures of the state government would put the teachers college libraries on a solid base and set the stage for their effective functioning.

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TRANSLATIONS AT EDITORIAL LEVEL

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All those associated in the Information Transfer Chain, including the editor, are facing the problem of language barrier and making determined efforts to cross it. The present tendency of many scientific periodicals to provide translations of different items of a paper has been discussed in this context. The items covered in this translation programme — titles and subtitles of periodicals, tables of contents, titles of papers, keywords, abstracts, captions of tables and classification numbers have been discussed in detail with examples. The impact of this tendency on Indian periodicals has been discussed and an Indian standard on this subject is suggested.

Introduction

The problem of Babel came into reality in the 17th Century when scientists in Europe started writing in their respective native languages discarding Latin, the language of elites. The language barrier thus created grew in size with the increased size of scientific literature published from different countries in different languages. At present nearly 50 per cent of the scientific literature of the world is published in English [1]. The rest is divided amongst Russian, German, French and other languages in different proportions. Thus scientists knowing only English remain in dark for about half of the world's literature in various fields. But in the race for scientific research, a scientist can afford to ignore the volume and value of non-English literature only at the risk of lagging behind. In order to make this literature available to the English speaking scientists translation works are being undertaken at different levels. Individual book and articles are being translated either on demand or in anticipation of it. Pools of translations like, National Translations Centre (NTC), British Lending Library (BLL), Transatom and European Translation Centre (ETC) have been created to store translations for future use, and to avoid costly duplication of translation works. Translation announcement bulletins, indicating availability of translations in different pools, have also come into the field. Cover to cover translations of important journals are also being published by learned bodies and commercial publishers to cross the language barrier. In this all out war against language barrier, editors of different scientific journals are also contributing their share.

The Work of the Editor

Information generated by a scientist is published normally in periodicals and is used by other scientists, who in their turn are also producers of scientific information. The whole cycle has been termed as Information Transfer Chain [2] and editors occupy a significant position in this chain to ensure a steady flow of useful information and to check pollution of the reservoir of knowledge. As responsible agents for scientific communication, editors have not overlooked the problems of language barrier and have taken some positive steps at their level to solve the problem partially. Editors along with the referees are controlling agents of scientific papers appearing in different periodicals. As sentinels for implementing publication policy of the periodicals, they can enforce upon the authors some rules, standards and patterns to be followed in their writings. In spirit with the current trends of battle royal against the language barrier, editors, in many cases, either force the authors in their 'Instruction to authors' and/or instruct the editorial office to provide mini translations of some of the useful items. The items covered in such instructions are usually the following:

1. Titles of the periodicals
2. Subtitles of the periodicals
3. Tables of contents
4. Headings in the table of contents
5. Titles of the papers
6. Keywords
7. Abstracts
8. Captions for figures/tables
9. Classification numbers

In translation of these items editorial office plays the dominant role, marginally supported by authors in some cases.

Titles of the periodicals

Title is the most vital element for identification of a periodical. Persons familiar with only Roman script will find it difficult even to identify the titles given in scripts like Cyrillic, Chinease etc. So this first hand information is being given in many periodicals in more than one language to cross the initial hurdle in literature search. Providing this translation is purely an editorial effort and responsibility.

The translation of titles of periodicals may be done due to two different reasons. Some of the countries like Canada and organisations like the United Nations have more than one official languages. Titles of periodicals in different languages published from these sources, reflect their language policy. Canadian Journal of Earth Science and Journal of the South African Institute of Mining and Metallurgy belong to this category. While the former provides titles in English and French, the latter gives a Dutch version of the title along with the English one. The second reason for providing translated title of periodical is the genuine desire of the publisher of the periodical to reach larger audiences among different linguistic groups. Within this category some differentiation could also be made. While some periodicals provide bilingual titles others go to the extent of providing multilingual titles. Thus Proceedings of the Geological Society of China (Taiwan) bears titles in Chinese and English, Inorganic Chemistry Review and Vizugui Kozlemenyek have titles in French, German, English, and French, German, English, Russian, Hungarian respectively.

Subtitles of periodicals:

Sub-titles of periodicals are provided as annotations of the titles used. These along with the titles are meant to explain the scope, coverage etc. of the periodicals. In view of the importance of this item in information dissemination, some editors provide translations of this item in languages, other than that of the language of the periodical. Thus Foldtani Kozlony, published from Hungary, contains this item in Hungarian, Rüssian, French, German and English.

Table of contents:

Table of contents of a periodical has a significant role to play in dissemination of information. It is the window through which the user can peep into the contents of the periodical. So it has rightly been compared with the menu card of a restaurant [3]. Besides the usual function of projecting the contents of a periodical, it is also being used to meet some derivative functions [4] by way of producing Current Awareness Service (CAS) of Current Contents type. Naturally this important item has drawn the attention of the editors from the points of view ot translation. Thus many periodicals, now a days, provide multilingual contents page, either within a single unit or alternative contents pages are provided in different languages.

At present many periodicals, like Chemical Geology have accepted more than one language as the carrier language of the periodical. Thus articles in different languages are accommodated in a single issue of the periodical. These multilingual contents are reflected in contents page by items in different languages. But in most of them no attempt is made for translation of the items. Surely, even without any translation, the periodical can reach different linguistic groups by the shear presence of multilingual contents, but use of a paper in a specific language remains restricted and may not reach other linguistic groups.

As a relief to this problem, some periodicals, mostly non-English, have adopted the policy of having alternative contents pages for different languages. The English exceptions include Journal of the Iron and Steel Institute, having continuous contents pages in English, German and French in succession. Among the others, Journal of the Geological Society of Japan, Geobios, Proceedings of the Geological Society of China (Taiwan), carry contents pages in two different language while Lethaia provides three separate contents pages in English, French and German and Vizugui Kozlemenyek has alternative contents page in Russian, English, French, German and Hungarian.

Many other periodicals, though they do not provide alternative content pages, follow the practice of giving translations of titles of articles in a different language or languages, in a single contents page. Journal of the American Concrete Institute, Biophysik and Zeitschrift fur Physik are examples of this type.

Headings in the table of contents;

Some of the omnibus periodicals now a days arrange items in their contents pages within broad subject groups under appropriate headings. This tendency can be observed in periodicals like Proceedings of the National Academy of Sciences, USA, Nature etc. The headings thus provided give a broad view of the contents and help the users to select items of interest. A few periodicals have considered the importance of providing translation of this item. Foldtani Kozlony, an East European exception, projects this item in Hungarian, Russian and English in succession.

Title of the paper

Title of a paper is usually considered as one line abstract of the document except for those cases where catchy titles are used simply to draw the attention of the readers. Whatever may be the type, title of a paper is a very important item in communication of scientific knowledge and thus is translated in many cases. It appears twice in an issue of a periodical once along with the paper and again in the contents page. We have already seen that translated titles of papers appear in contents pages of some periodicals. Title of the paper is also given in different languages at the initial page of the paper. Thus Lethaia provides translated version of title, following the original and placed within parenthesis. Many of the Elsevier periodicals like, Chemical Geology International Journal of Mineral Processing, Precambrian Research, etc. in their instructions to authors mention.... "Official language of the journal is English, but occassional articles in French and German will be considered for publication. Such articles should start with an abstract in English, headed by an English translation of the title......"

Keywords.

Publication of keywords along with the other details of a paper is comparatively a recent development in the field of scientific publication. The practice has received momentum with the steadily increasing use of keyword indexes in different primary and secondary periodicals. Many of the periodicals now a days insist that the author should supply few relevant keywords along with the manuscript submitted by him. The idea is to convey economically a little more about the contents of the paper. Some of the current periodicals like Geobios not only provide keywords but their translated versions in other languages.

Abstract of a paper is not only a surrogate but a gate through which original paper can be seen. The importance of this item in communicating knowledge was recognised long back. Now a days almost every scientific periodical publishes the paper preceded by an abstract. Some of them include this item even in their contents pages. In view of its importance it is not surprising that many periodicals now a days provide abstracts in alternative languages. Out of a long list of such periodicals, a selected few titles are mentioned below:

Eclogao Geologicae (English and German abstracts for German papers), Proceedings of the Geological Society of China (Taiwan) (English and Chinese), Geobios (English and French), Canadian Geotechnical Journal (English and French) and Naturwissenschaften (English and German).

Captions for figures/tables:

The art of technical writing demands along with other things precise short and meaningful tables supported by explanatory but short legends. This practice has been focussed prominently in almost all the style manuals of eminent publishing houses. So the importance of this item was recognised long back and consequently included in mini-translation programme of the editorial office. Chemical geology, Sedimentary geology, Marine geology, Palaeogeography, palaeoclimatology, Palaeoecology, all published by Elsevier insist in their 'instructions to authors' that for all non-English papers "English translation of the figure caption should also be given." Other periodicals following this practice include Vizugui Kozlemenyek (Hungarian, English and German), Foldtani Kozlony (Hungarian and German), Bulletin of the Geological Survey of Japan (Japanese and English) and Vesnik Geologija (in 2 languages).

Classification number

Present day periodicals, which have gone through evolutionary processes since the days of Journal des Scavans, have adopted in a few cases the healthy practice of classifying each article according to a classification scheme (mostly UDC). Though this practice is mostly followed in East European periodicals, even some others like Endeavour, Indian Journal of Meteorology and Geophysics follow this trend.

Classification may not be considered as translation in a conventional sense. But surely it plays a significant role in crossing the language barrier. UDC being an internationally known and much used classification scheme, its unique notation conveys the same meaning to persons using different languages. For example a paper on mining written in any language can easily be identified by noticing the UDC notation 622 attached with it. Thus the subject contents of the document are indicated by UDC in spite of the language barrier. The editorial effort for providing this number, for all practical purposes, should be considered along with translation at editorial level.

The Indian Scene

Though major scientific periodicals of this country are published in English some of them are also coming up in regional languages. The over looking of the problem of editorial translation by the English scientific periodicals of India is compensated to some extent by the periodicals in regional languages. The items covered in translation programmes of such periodicals are mostly titles (of periodical and of document), abstracts and contents pages. Thus in the field of geology, Bhuvignan carries English abstracts of Hindi papers. In the field of library science, Granthagar, a Bengali periodical, carries the title of the periodical, contents page and abstracts in English. Indian Journal of Meteorology and Geophysics and Journal of the Institution of Engineers of India provide classification numbers for papers published in their issues. Although the tendency for providing editorial translations is not yet deep rooted in Indian periodicals, a start has been made and its impact is expected to be felt in the near future.

Conclusion.

The data collected for this paper are mostly from periodicals on earthscience, but probably a general statement regarding this trend of providing translation at editorial level can be made about scientific periodicals in general. This trend has been tested by time and proved to be useful. With the increased importance of different languages in scientific communication, gradually more periodicals both in English and regional languages should take note of this trend and try to reach wider audiences by adopting this practice. Standard organisations should also include these items in their future prescriptions. We should not take an indifferent attitude to this problem; rather our motto should be if it is useful to somebody, it may be useful to us also.

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RANKING OF PERIODICALS IN THE FIELD OF ASTRONAUTICS AND AERONAUTICS

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Citation study of two AIAA periodicals have been made in order to evaluate the relevance of periodicals to SHAR Centre of Indian Space Research Organisation and to adopt selective acquisition policy for periodicals.
An analysis of the collected citations have been made and the periodicals cited have been ranked and listed.

Introduction:

Periodicals act as medium for the communication of ideas, exchange of experience and transmission of current information. It is a fact that most new discoveries and novel ideas first appear as periodical articles and large number of these articles do not subsequently go into any other form of publication. It is because of this that it is important for libraries to collect and store files of periodicals [1].

The ever increasing number of scientific periodicals, their higher subscription cost, and more space to store are compelling libraries to select only those periodicals which are of reasonably high relevance to the users' field of interest. Bradford stated in his "Law of Scattering" that about a third of the articles on a subject are available in the periodicals devoted to that subject, a further third appear in a larger number of periodicals devoted to related subjects, and the remaining third in an ever larger number of periodicals, in which such articles would not normally be expected to be published [2, 3].

In support of Bradford's Law many studies have been published [4, 5, 6]. Eugene Garfield has used "Citation analysis as a tool in journal evaluation" and has stated that journals can be ranked by frequency of citations [7].

In the process of selective acquisition of useful periodicals in the field of Astronautics and Aeronautics in the Information Section at SHAR Centre, citation analysis of the publications of American Institute of Aeronautics & Astronautics (AIAA, New York) has been carried out studying the reviews and notes, and seeking experts' suggestions. The AIAA publishes the following six periodicals:

1. AIAA Journal
2. Journal of Spacecraft & Rockets
3. Astronautics & Aeronautics
4. Journal of Hydronautics
5. Progress in Astronautics & Aeronautics
6. Journal of Aircraft.

For the purpose of analysis, the first two periodicals, namely, the AIAA Journal Vol. 14, 1976 (12 issues) and the Journal of Spacecraft & Rockets Vol. 13, 1976 (12 issues) have been selected. They are the source journals of this study.

Scope of Source Journals

i) AIAA Journal is devoted to the advancement of Astronautics through the dissemination of original papers disclosing new technical knowledge in the field of Astronautics and Aeronautics which includes jet and rocket propulsion, space flight, atmospheric flight, hydronautics, combustion, fluid dynamics, astroydynamics, guidance, flight control, structures, physics of the atmosphere and space and information systems.

ii) The Journal of Spacecraft and Rockets is devoted to the advancement of the science and technology of space flight through the dissemination of original papers describing significant advances in space technology, use of spacecraft, application of space technology, design and development, missions of spacecraft, missile, launch vehicles and space planes, system analysis, flight operations, flight testing, reliability problems, development of propulsion systems, control systems, payloads etc.

Analysis

AIAA Journal in its Volume 14, Jan-Dec 12 issues of 1976, has published 426 papers of different category as listed in Table 1. They are Synoptics (40) 9.40%, Survey papers (includes one lecture) (4) 0.94%, contributed papers (200) 46.95%, Technical notes (157). Contributed papers and Technical notes are more in number (357) covering 83.80% of the published material.

Journal of Spacecraft & Rockets in its Volume 13, Jan-Dec 12 issues of 1976, has published 154 papers as listed in Table 1. They are Synoptics (8) 5.19%, contributed papers (101) 65.59%, and Engineering Notes (45) 29.22%, which reveals that contributed papers are more in percentage which is the main media in the dissemination of new knowledge.

The high percentage of contributed papers reveals not only the importance of these periodicals in the Astronautics & Aeronautics field but also the extent to which the scientists depend upon this publication for getting their work published.

Citation Analysis:

The analysis of the bibliographic references cited in every issue of AIAA Journal Volume 14 Jan-Dec. 1976 (12 issues) and Journal of Spacecraft & Rockets Volume 13 Jan-Dec. 1976 (12 issues) as in Table II, reveals that in both the periodicals, journal literature have been cited more in number i.e., (2495 & 549) 49.62% and 38.88% of the total references cited respectively. It is obvious that periodicals are most important media in communicating the original literature. Next comes the technical report literature. Specially in Astronautics and Aeronautics field, the importance of the technical report literature is emphasised by the percentage cited i.e., 20.26% and 29.82%. Then comes the conference papers (14.75% and 16.44%) and books (12.3% and 12.40%).

Table III reveals that the survey papers (4) have cited more number of references (294), on an average of 73.5 per paper, whereas the contributed papers have cited on an average 16.09 references per paper in the AIAA Journal. In the Journal of Spacecraft & Rockets, as shown in Table III, the contributed papers have cited more reference, namely, 11.12 per paper on an average.

Citation to Periodical Publication:

An examination of Table IV reveals the familiar pattern of dispersion of source items in primary periodicals similar to the pattern described by Bradford. The first item in the list, that is, the AIAA Journal was found to have received nearly one third of the total number of citations in this Survey; further, 78.52% of the citations come from the first 50 periodicals and the remaining percentage, that is 21.48% of the references spill over in the next 164 titles.

An examination of Table V reveals the same pattern as above, the first item in the list, the Journal of Spacecraft & Rockets was found to have received more than one fourth of the total number of citations. 71.4% of citations come from first 25 periodicals, and the remaining percentage of citations, amounting to 28.6%, have been spilled over in the next 92 periodicals.

Conclusion:

The above figures disclose the pattern of concentration and dispersion of literature in the field of Astronautics and Aeronautics. These ranked lists may be taken into consideration as tools in selecting more relevant periodicals in the field of Astronautics & Aeronautics.

The above study has helped us to some extent in the selective acquisition of periodicals in our Centre. However, this analysis has got some limitations: Periodicals ranked by frequency of citations in published literature do not invariably indicate a high intrinsic quality of the periodicals. The frequency of citation is influenced by various factors, such as author's reputation, reprint dissemination, coverage in indexing and abstracting services, geographic and language barriers and national bias.

However, the results of this analysis will not only help the special library management but also specialist readers in selecting the periodicals more relevant to their field of interest to keep them abreast with the latest development in their field of specialisation. The ranked list will also serve as a selection tool in developing a core collection for the special library as well as for compilling references and reading lists.

Acknowledgement:

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AIAA JOURNAL ANALYSIS

Details of papers	Total Papers	Percentage
Synoptics	40	9.40
Survey Papers (Including Lectures)	4	0.94
Contributed Papers	200	46.95
Technical Notes	157	36.85
Technical Comments	25	5.86
Total	426	100.0

Table I

JOURNAL OF SPACECRAFT AND ROCKETS

Details of Papers	Total Papers	Percentage
Synoptics	8	5.19
Contributed Papers	101	65.59
Engineering Notes	45	29.22
Total	154	100.00

Table III

SOURCE PAPERS AND CITATIONS AIAA JOURNAL

Details of Papers	Total Number of Papers Published	Total Citations	Average
Synoptics	40	234	5.85
Survey Papers	4	294	73.5
Contributed Papers (including Lectures)	200	3218	16.09
Technical Notes	157	1154	7.35
Technical Comments	25	129	5.16
Total	426	5029	11.8

JOURNAL OF SPACECRAFT AND ROCKETS

Details of Papers	Total Number of Papers Published	Total Citations	Average
Synoptics	8	35	4.38
Contributed Papers	101	1123	11.12
Engineering Notes	45	254	5.64
Total	154	1412	9.17

Table II

Type of Documents	References cited in AIAA Journal		References cited in Journal of Spacecraft and Rockets	
	Number of References	Percentage	Number of References	Percentage
1.	2.	3.	4.	5.
Journal Articles	2495	49.62	549	38.88
Technical Reports*	1019	20.26	421	29.82
Conference Papers	742	14.75	232	16.44
Books	605	12.03	175	12.40
Thesis and Desertations	118	2.35	28	1.97
Miscellaneous	50	0.99	7	.49
Total	5029	100.00	1412	100.00

RANKING OF PERIODICALS IN ASTRONAUTICS & AERONAUTICS

LIST OF PERIODICALS CITED IN AIAA JOURNAL VOL. 14 - 1976

Sr. No.	Title of Journal	No. of citations
1.	AIAA Journal	714
2.	Journal of Fluid Mechanics	713
3.	Journal of Chemical Physics	97
4.	Physics of Fluids	81
5.	Journal of Aerospace Sciences (Incorporated with AIAA Journal)	69
6.	Journal of Applied Mechanics (ASME)	65
7.	Journal of Spacecraft and Rockets	63
8.	Applied Physics Letters	43
9.	Journal of Applied Physics	41
10.	Journal of Aircraft	37
11.	IEEE Journal of Quantum Electronics	35
12.	International Journal of Heat & Mass Transfer	33
13.	Proceedings of Royal Society of London. Series. A: Mathematical and Physical Sciences	29
14.	Physical Review Letters	27
15.	IEEE Trans. on Automatic Control	27
16.	Aeronautical Quarterly	25
17.	Journal of Physical Chemistry	23
18.	Journal of Heat Transfer (ASME)	22
19.	Combustion Science and Technology	20.
20.	Combustion and Flame	20
21.	Journal of Basic Engineering (ASME)	19
22.	International Journal of Numerical Methods in Engineering	16
23.	Journal of Sound and Vibration	15
24.	Astronautics and Aeronautics	15
25.	Journal of Computational Physics	14
26.	Journal of Composite Materials	14
27.	Journal of Geophysical Research	14
28.	Journal of Quantitative Spectroscopy and Radiative Transfer	13
29.	International Journal of Mechanical Sciences	12
30.	Journal of Physics E: Scientific Instruments	11
31.	Proceedings of ASCE: Journal of Eng. Mech. Division	11
32.	Quarterly of applied mathematics	11
33.	Journal of Optimization Theory and Application	10
34.	Acta Astronautica	10
35.	Review of Scientific Instruments	10
36.	Acoustical Society of America Journal	9
37.	Journal of Atmospheric Sciences	9
38.	Communications on Pure and Applied Mathematics	9
39.	Zeitschrift Fur Angewandte Mathematic und Mechanik	9
40.	Zeitschrift Fur Flugwissenscharften	9
41.	SIAM Journal of Numerical Analysis	9
42.	Transactions of the Fanaday Society	9
43.	AICHE Journal	9
44.	Soviet Physics JETP	9
45.	Applied Optics	8
46.	Computers and Fluids	8
47.	Philosophical Transactions of the Royal Society of London	8
48.	Optical Society of America Journal	8
49.	Planetary and Space Science	7
50.	Chemical Engineering Progress	7
	Other 163 titles	529
	Total	2495

LIST OF PERIODICALS CITED IN JOURNAL OF SPACECRAFT & ROCKETS VOLUME 13, 1976

Sr. No.	Title of the Journal	No. of Citations
1.	Journal of Spacecraft and Rockets	139
2.	AIAA Journal	104
3.	Astronautics and Aeronautics	15
4.	Icarus	12
5.	Journal of Aeronautical Sciences	10
6.	Journal of Aircraft	10
7.	Journal of Astronautical Sciences	10
8.	Journal of Geophysical Research	10
9.	Acta Astronautica	8

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Sr. No.	Title of Journal	No. of Citations
10.	International Journal of Fracture Mechanics	7
11.	Astrophysical Journal	6
12.	Journal of Applied Mechanics (ASME)	6
13.	Journal of Fluid Mechanics	6
14.	Aeronatucal Quarterly	5
15.	Celestial Mechanics	5
16.	IEEE Trans on Automatic Control	5
17.	Journal of Aerospace Sciences	5
18.	Applied Mechanics Reviews	4
19.	IEEE Trans on Aerospace and Electronic Systems	4
20.	Israel Journal of Technology	4
21.	Physical Review Letters	4
22.	Shock and Vibration Bulletin	4
23.	Journal of Basic Engineering	3
24.	Astronomical Journal	3
25.	Automatica	3
26.	Bulletin of the American Physical Society	3
27.	International Journal of Heat and Mass Transfer	3
28.	International Journal of Non-Linear Mechanics	3
29.	Journal of Physics D: Applied Physics	3
30.	Kosmicheskie Issledovaniia	3
31.	Quarterly of Applied Mathematics	3
32.	Zeitschrift Fur Angewandte Mathematik und Mechanik	3
33.	Journal of Heat Transfer (ASME)	2
34.	Journal of Engineering for Industry (ASME)	2
35	Canadian Aeronautics and Space Institute Transactions	2
36.	International Journal of Mechanical Science	2
37.	International Journal of Solids and Structure	2
38.	Journal of Applied Polymer Science	2
39.	Journal of British Interplanetary Society	2
40.	Journal of the American Society of Naval Engineering	2
41.	Journal of Optimization Theory and Applications	2
42.	Journal of the Royal Aeronautical Society	2
43.	Journal of Applied Mathematics and Mechanics (PPM)	2
44.	Proceedings of the Royal Society of London	2
45.	Radio Science	2
46.	Review of Geophysics and Space Physics	2
47.	Philosophical Transaction of Royal Society (London)	2
48.	Acta Electronica	2
49.	Aeronautical Engineering Reviews	2
50.	Air University Review	2
	Other 67 titles	100
	Total	549

INFORMATION AND DOCUMENTATION SERVICES IN CHEMISTRY AND CHEMICAL TECHNOLOGY

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A multitier information networks for Science and technology entitled National Information System for Science and Technology (NISSAT) has been approved by the Government. Discipline oriented information centres form the middle order link in this network. Salient features of such a centre for chemistry and chemical technology at N.C.L., Pune are outlined in the present paper.

1 INTRODUCTION

National Chemical Laboratory, Poona is one of the national laboratories/institutes under the control of Council of Scientific and Industrial Research, New Delhi. From the very inception, the N.C.L. contained a library wing. This library was charged with the responsibility of procurement, processing and maintaining of documents relating to chemistry and chemical technology.

This paper describes the various activities and services of N.C.L. Library available at the moment. It further gives the planned expansion and developmental proposals for the next five years i.e. from 1977-78 to 1981-82. These proposals will transform the library into a Branch Information Centre for Chemistry and Chemical Technology under National Information System for Science and Technology (NISSAT).

PERSENT RESOURCES, FACILITIES AND SERVICES

21 Growth of literature

Growth of chemical literature has been astonishingly rapid from early days. However, Chemists took note of it earlier than their co-workers in other fields of science. The increase in the number of items in C.A. can be seen in the

The number of abstracts 11,874 in 1907 has grown to 3,21,005 in 1973 and reached 3,90,905 in 1976. It covered 14,000 periodical publications published from 150 countries and included over 50,000 chemical patents from 26 countries in 1973. The average annual growth of abstracts in C.A. is 8.2%.

Any R&D organisation in chemistry and chemical technology in any part of the world has to scan over 4.54 lakh items annually. The sheer volume makes it essential to organise them properly in order to support the research and developmental work in the country. This could be better achieved through well organised information centres.

22 Document collection

(a) Books, Monographs etc.

N.C.L. Library houses 47,000 books, monographs etc. The present annual intake of the NCL Library is around 2,000 publications which includes books, monographs, advances, progresses etc. The Chemical Abstracts included 2611 books, monographs etc. in 1973. This number might have crossed 3,000 mark by 1975 and may reach 5,000 by 1981-82. The coverage of Chemical Abstracts is almost comprehensive. As such we should try to procure all the books listed in C.A.. It is, therefore, proposed to raise our annual intake to 5,000 books, monographs etc. by 1981-82.

(b) Periodicals

The library has back sets numbering 25,500 bound volumes. It subscribes to 460 titles presently. It may be recalled that 50% literature in C.A. comes from 325 periodicals, and 75% papers included in Chemical Abstracts come from about 1384 titles. Our aim would be to get at least 1000 titles in our Library. This will make our centre self sufficient in periodical literature, at least to the extent of nearly 70% included in the Chemical Abstracts.

CHEMICAL ABSTRACTS: GROWTH

Year	Number of Abstracts			Total Abstracts
	Papers	Patents	Books	
1907	7,994	3,853	-	11,847
1920	13,619	4,432	1,275	19,326
1930	32,731	21,246	1,169	55,146
1940	40,624	11,635	1,421	53,680
1950	47,496	10,061	1,539	59,098
1960	1,04,484	27,675	2,096	1,34,255
1965	1,65,770	29,225	2,088	1,97,083
1970	2,30,902	43,044	2,728	2,76,674
1973	2,69,711	48,683	2,611	3,21,005
1975	-	-	-	4,54,245
1976	-	-	-	3,90,905

(c) Patents & Standards

N.C.L. Library is an inspection centre for Indian patents. It receives each and every printed Indian patent, as and when issued. The present stock of these patents may be around 7,10,000. Other related publications like (i) Gazette of India, Part III Section 2, (ii) Abridgements of specifications, (iii) Indexes to Indian patents, (iv) Patent Office Journal, and (v) Annual Report of Patent Office etc. are also received under the scheme.

Our intake of foreign patents and standards is limited to the specific requests of our scientists which is hardly over 200 a year. It is proposed to develop a good stock of chemical patents which are vital for industrial research. As per statistics available from Chemical Abstracts, about 48,683 patents were included in C.A. in 1973. It is suggested that we should try to procure 50,000 patents in our library which may be relevant to chemistry and chemical technology.

Being an Associate member of Indian Standards Institution, New Delhi, we receive all Indian Standards. Procurement of foreign standards is much less in number. These foreign standards held in our library may be around 2,500.

(d) Computer Readable Materials

C.A. Condensates

Vastness of chemical literature has led to the development of computerised information systems in USA and in some European countries. Chemical Abstracts Services themselves have been computerised. They are producing C.A. Condensates on magnetic tapes which are manipulated with the help of computer. It is, proposed to procure one set of these tapes on lease basis and use for information retrieval services like Selective Dissemination of Information, compilation of retrospective bibliography and project oriented current awareness services. The required software will be developed at the centre. A computer of latest model is being installed at Poona University in collaboration with N.C.L. This computer facility could be used for handling the C.A. tapes also.

The CHEM/SDI services of Insdoc, New Delhi cater to the needs of scientists in India and South East Asia. The large demands of our laboratory as well as industries and other research organisation in the Western India will justify the need of this computerised services from N.C.L.

23 Equipment and Furniture

Equipment

N.C.L. Library possesses microcard readers, microfilm readers and our Photography Section is well equipped for reprographic purposes. However, we may need a few additional items like microfiche reader, Xerox copier and Offset printer etc. to augment our services.

We do not have any data processing equipment. A detailed requirement of these items is give in the enclosed Annxure IV.

Furniture

The library has all furniture and fittings to accommodate our present stock and readers. But expanded activities in the proposed centre will need additional items such as book-racks, display racks, vertical file cabinets, book trollies, side-racks, tables and chairs etc. The additional items may cost about Rs. 1,75,750.00.

24 Manpower

At present the library staff comprises of 13 library technical, 2 mistry, 2 typists and 6 Class IV and photography section is manned by only two technical persons. The centre would need the services of 55 additional hands by 1981-82 to manage the various services envisaged in the proposal. Annexures I and II present the details of the present strength as well as additional staff requirements of the centre.

25 Services

At present the library offers the following services to its users:

1. Circulation of documents.
2. Inter-library loan of documents.
3. Reference Service to its users.
4. Documentation/Information Services.

(a)	Current Literature on Agrochemicals & Pesticides	(Monthly)
(b)	Patent Information Bulletin	(Monthly)
(c)	Current Literature on Solar Energy	(Monthly)
(d)	Chemical Reactors	(Bi-Monthly)

5. Reprographic services of the documents available in our library.

We propose to augment the above services by expanding the scope and coverage and also to add some new services as explained in the para 3.7.

26 Other Inputs

Space: The space available for the library at the present moment is just enough to accommodate the current activities and services. If the proposed expansion is accepted, we may need a separate building to house the library and documentation services in N.C.L. The estimated space requirements will be around 3350 Sq.m.

The construction cost of building at the present price level, will be around Rs. 1000 per Sq.m. Thus the total cost of the building will be Rs. 33.50 lakhs approximately.

3 PLAN FOR DEVELOPMENT

31 Justification

It is well known that information services are very vital to support research & development and technology efforts in any subject field. Our national plan for Science and Technology has also envisaged the establishment of a national network of information systems for science and technology. This multitier system envisages the setting up of Branch Information Centres in major disciplines of Science and Technology. With such a huge national effort in R&D in chemistry and chemical technology (Rs.40.00 crores based on 1970-71 prices), it is sure that a Branch Information Centre in this subject area will find a place in the national network.

The volume of information generated in the area as detailed under 21 is so large that the establishment of a well organised information service becomes a necessity. With the facilities available in N.C.L. as detailed under 2, it is thought that this library could be expanded and developed as a national information centre for Chemistry and Chemical Technology.

The centre will form part of the National Information System for Science and Technology (NISSAT) and will work as a link between national centres of information at higher level and local information units at lower level. The facilities available with us could be utilized on a broader scale which will fill up gaps in information resources and facilities in the country. The proposed mechanised information services like SDI on CA condensates and setting up of data bank will offer a centralized service to the country. The participation in the world programme such as UNISIST for exchange of information could be more meaningful through this centre.

32 Area of Information Sources and Services

The centre will try to procure all types of information sources such as books and monographs, periodical literature, patents and specifications, reports, trade literature and other special materials available in the subject field. Several kinds of information such as scientific and technical, techno-economic, industrial etc. will be processed and retrieved in the centre. The services and facilities of the centre will cover all categories of users such as R&D personnel, technicians, engineers, academic personnel, students and all others who are interested in scientific activity in Chemistry and Chemical Technology.

33 Subject fields involved

The subject field covered by the centre will be Chemistry and Chemical Technology.

34 Objectives

The objectives of the centre will be derived from and be in conformity with overall goals of the laboratory and national plans for the research and development of Chemistry and Chemical Technology. Its main objectives would be:

1. To provide information services to N.C.L. Scientists, Chemical industries, Research Institutions and other organisations and individuals who are interested in the field.
2. Be a clearing house for information on Chemistry and Chemical Technology.
3. Be a link in the total system of information for Science and Technology (NISSAT).
4. To promote national and international co-operation and liaison for exchange of information and expertise.

35 Proposed Responsibilities

The centre will be assigned the following responsibilities:

1. To identify information needs of users by conducting surveys.
2. To build up and maintain a document collection.
3. To compile union catalogues in Chemistry and Chemical Technology.
4. To provide information/Documentation Services as under:
    - i) Reference Services - Ready as well as Long Range.
    - ii) Current Awareness Services.
    - iii) Selective Dissemination of Information.
    - iv) Patent Information Service.
    - v) Retrospective bibliography.
    - vi) Ongoing Researches.
    - vii) Data compilation and service.
5. To develop computer based information services.
6. To organise translation services.
7. To organise reprographic services.
8. To promote creation and development of local information units by offering advisory services and technical assistance.
9. To maintain close liaison with other information/Documentation centres in the country and abroad to exchange ideas and expertise in the methodology of documentation services.

36 Structure and Organization Proposed for Centre

The Information Centre will be a part of the Laboratory and will be governed and administered by the Director, N.C.L. The Chief of the Centre would be a Technical Head and responsible for routine administration.

The Centre may be advised and guided by an Advisory Committee constituted by the Director, N.C.L.

The work of the centre would be organised into different sections such as (1) Library (2) Documentation/Information Services (3) Data Bank (4) Translation (5) Reprography (6) House Keeping Section. An organisational chart along with their functions, is given in annexure VI.

37 Services to be Offered

The services offered by the centre would be:

A. Reference Serices - Ready & Long Range.
B. Current Awareness Services.
C. Selective Dissemination of Information.
D. Patent Information Service (Indian)
E. On-going Researches.
F. Data Compilation and Services
G. Retrospective Bibliographic Services.
H. Translation Services.
I. Reprographic Services
J. Advisory & Technical Assistance to Local Information Units.

(A) Reference Service

i) Ready: Ready Reference Service consists of finding answers to specific queries put by the users with the help of references collection such as encyclopaedias, dictionaries, handbooks, maps, formulary etc. The time taken in replying such questions is very short, around 10 to 15 mintues.

ii) Long-Range: This service consists of finding answers to queries put by users normally involving a longer time. For answering such questions a variety of docuements such as reference collections, monographs, technical reports, periodical articles, patents, standards etc. are consulted. Sometimes a documentation list or a short wirte-up is prepared to meet the requirements of the users. At present the Library provides only Ready Reference Service to our users. This service will be augmented with the increased intake of documents and additional staff.

(B) Current Awareness Service

This will be issued in 5 separate sections as under:

1. Applied Chemistry and Chemical Engineering.
2. Biochemistry.
3. Organic Chemistry.
4. Macromolecular Chemistry.
5. Physical, Analytical and Inorganic Chemistry.

Purposes: To keep the research and development personnel abreast of the latest developments in their field of interest. This will also inform the users of the latest additions to the library.

Periodicity: Weekly or Fortnightly.

Source and Emphasis: Current periodicals, technical reports, standards, and other micro-documents as soon as received in the Library.

Make up of Text: The main part will be grouped into broad subject headings. Under each such group entries will be arranged alphabetically by source, periodicals, reports etc. Author Index and list of source periodical will be provided at the end.

Coverage: About 300 entires will be included in one issue.

Distribution: Project leaders and other research and development personnel in N.C.L. and other organisations and industries.

Schedule of Charges: Outside parties will be charged for this service.

(C) Selective Dissemination of Information

This service will be based on Chemical Abstracts Condensates magnetic tapes and will consists of articles and patents. These articles and patents could be available separately as well as combined to a particular user. The matching will be done with the helps of a computer.

Purpose: To keep the clientele abreast of the current developments in their respective fields of interest.

Periodicity: Fortnightly/Monthly.

Source and Emphasis: Chemical Abstracts condensates of magnetic tapes.

Make of the Text: According to the needs of individual profiles.

Coverage: 100 Profiles in the beginning.

Distribution: According to users profiles.

Schedule of Charges: Users, other than N.C.L. personnel will be charged for the service.

(D) Patent Information Service

N.C.L. Library is an "Inspection Centre" for Indian patents. As such we receive every printed Indian Patents and other documents issued from Patent Office, Calcutta. This service will be based on the literature available under the above arrangement.

Purpose: To keep the research and development personnel abreast of the latest development in respect of Indian patents.

Periodicity: Monthly.

Source and Emphasis: Gazette of India, Part III. Section 2 and Indian patents as soon as received in the Library.

Make up of the Text: Main part consists of three sections viz. (1) Application (2) Complete specification accepted and (3) Printed Patents. Entries in each section are arranged under feature headings according to U.D.C. schedule. Patentee and subject indexes are provided at the end.

Coverage: About 300 entries in an issue.

Distribution: Project leaders and other research and development personnel of N.C.L., other organisations and industries.

Schedule of Charges: Outsiders will be charged for the service.

(E) On-going Researches

The necessary information of current researches in various organisation, institutions, laboratories etc. in India will be collected in a convenient form and will be processed in the centre.

Purpose: The above information will bring to the knowledge of research and development personnel, the various types of researches in progress at various places. This may help in avoiding possible duplication of efforts in the country.

Periodicity: A routine function of the centre.

Source & Emphasis: Will be collected from various research institution in India.

Make up of the Text: Depends on the subject and needs of the user.

Coverage: Will depend on the requester.

Distribution: As and when requested.

Schedule of Charges: Outsiders will be charged.

(F) Data Compilation and Services

Purpose: To collect techno-economic data relating to chemicals and chemical industries in India in a convenient form so that it can be computerised later on.

Periodicity: A routine function.

Source & Emphasis: A variety of original documents including correspondence.

Make up of Text: Tables, graphs, diagrams, charts etc.

Coverage: Will depend on the requester.

Distribution: On request.

Schedule of Charges: Outsiders will be charged for the service.

(G) Retrospective Bibliography

Purpose: To provide a list of documents on a given specific subject.

Periodicity: On request. Around 20-25 years.

Source and Emphasis: Retrospective search, selection and listing of all relevant documents viz. books, articles, patents, reports, standards etc.

Make up of Text: Main Part: Entries, classified, featured and arranged according to some schedule of classification (U.D.C.).

Supplementary Part: Author and subject indexes.

Coverage: Will depend on subject and needs of the requester.

Distribution: On demand.

Schedule of Charges: Outsiders will charged.

(H) Translation Services

Purpose: To provide English translation of scientific and technical literature available in other languages such as German, Russian, French, Japanese etc.

Periodicity: A routine function.

Source and Emphasis: Periodical articles, patents, technical reports and other micro-documents.

Make up of Text: As per original document.

Coverage: About 200 documents per year.

Distribution: On request.

Schedule of Charges: This service will be available against payment except for N.C.L. needs.

(I) Reprography

Purpose: To supply copies of articles and other micro-documents in the form of microfilms, xerox/photocopies.

Photocopies: Routine function.

Source and Emphasis: Literature available in NCL Library.

Make up of Text: As per original document.

Coverage: The actual quantum cannot be ascertained at the present moment. But the service will be capable of providing the following volume of work annually.

1.	Microfilm strips	- 10,000/Yr.
2.	Xerox copies	- 10,000/Yr.
3.	Photocopies	- 20,000/Yr.

In addition to the above, the preparation of multiple copies of other information/documentation service will be entrusted to this section.

Distribution: On demand.

Schedule of Price: Copies will be supplied against payment.

(J) The centre will assist the local information units in technical matters by way of advisory services and technical assistance.

4 ESTIMATE OF REVENUE

The present Library facilities are available freely to N.C.L. Staff, students and research and development personnel of Government Departments and agencies. Nominal consultation charges are levied to personnel belonging to private sector industries and other individuals. Annual income from this source for the last four years are as under:

1973-74	- Rs.4,275.00
1974-75	- Rs.5,450.00
1975-76	- Rs.6,430.00
1976-77	- Rs.5,835.00

The above consultation charges may be raised when our coverage is expanded.

It is not possible to calculate the estimated revenue from other services. It is proposed that the schedule of charges would be decided as and when a new service is started in the centre.

5 FINANCIAL REQUIREMENTS

N.C.L. Library spends Rs.6.00 lakhs on the procurement of documents annually. About 80% of this expenditure is consumed in periodicals subscription. Expenses on staff and other inputs like equipment, furniture, building etc. are met from the combined grant of the laboratory. Additional investment required to develop the Centre is given in the table in the next page.

7 ACKNOWLEDGEMENT

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FINANCIAL ESTIMATES

Order of additional investment required to develop the Centre during 1977-78 to 1981-82

(Rs. in lakhs)

Sr. No.	Heads of Expenditure	Phased need over the next five years					Total	Foreign exchange requirements
		1977-78	1978-79	1979-80	1980-81	1981-82		
1.	Salaries & Allowances	0.84	2.20	3.75	4.86	5.21	16.86	-
2.	Chemicals & Apparatus	0.175	0.52	0.81 (0.04)	1.06 (0.06)	1.31 (0.08)	3.875 (0.18)	0.18
3.	Books & Periodicals	1.39	3.005	4.62	6.985	8.56	24.560	-
4.	Equipment & Furniture	0.165	1.29 (1.00)	3.81	2.423	0.55	8.238 (1.00)	1.00
5.	Building	-	10.00	23.50	-	-	33.50	-
6.	Others: Computers readable materials	-	-	0.80 (0.80)	1.30 (1.30)	1.30 (1.30)	3.40 (3.40)	3.4
	Total:	5.570	17.015 (1.00)	37.29 (0.84)	16.628 (1.36)	16.93 (1.36)	94.433 (4.58)	4.58

1. Foreign components are shown in brackets.
2. Details of the above requirements are given in annexure I-V.
3. Figures shown under salaries and allowance do not include leave salary.

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STANDARDS

1. IS: 1553-1960 - Indian Standard code of practice relating to primary elements in the design of library building. 1960. New Delhi. ISI.

2. IS: 1829-1961 (Part I) - Indian Standard Specification for Library furniture and fittings. Part I. Timber. 1961. New Delhi. ISI.

ANNEXURE - I

SALARIES AND ALLOWANCES

Sr. No.	Designation	Present		1977-78		1978-79		1979-80		1980-81		1981-82	
		No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary
1.	Chief Doc. Officer (Sc. E)	-	-	-	-	1	22,236.00	1	22,236.00	1	22,236.00	1	22,236.00
2.	Senior Doc. Officer (Sc. C)	-	-	1	19,116.00	2	38,232.00	2	38,232.00	3	57,348.00	3	57,348.00
3.	Doc. Officer (Sc. B)	1	11,400.00	2	22,800.00	4	45,600.00	8	91,200.00	10	1,14,000.00	11	1,25,400.00
4.	Jr. Doc. Officer (Sc. A)	1	12,402.60	3	37,207.80	4	49,610.40	7	86,818.20	7	86,818.20	8	99,220.80
5.	Sr. Doc. Asst. (STA)/ Sr. Librarian	2+1	31,483.80	4	41,978.40	5	52,473.00	6	62,967.60	10	1,04,946.00	11	1,15,440.00
6.	Jr. Doc. Asst. (JTA) / Jr. Librarian	2+1	26,100.00	4	34,800.00	6	60,200.00	11	95,700.00	12	1,04,400.00	12	1,04,400.00
7.	S.L.A.	-	-	1	7,345.20	1	7,345.20	1	7,345.20	2	14,690.40	2	14,690.40
8.	Jr. Lib. / Cataloguer 'A'	5	33,180.00	5	33,180.00	5	33,180.00	6	39,816.00	7	46,452.00	7	46,452.00
9.	Cataloguer 'B'	-	-	1	5,413.20	2	10,826.40	2	10,826.40	2	10,826.40	2	10,826.40
10.	Mistry (Binder)	1	5,413.20	1	5,413.20	1	5,413.20	1	5,413.20	2	10,826.40	2	10,826.40
11.	Library Attendent/ Record Keepers	6	26,330.80	7	30,777.60	9	39,571.20	11	48,364.80	12	52,761.60	13	57,158.40
12.	Clerks	2	10,826.40	2	10,826.40	3	16,239.60	4	21,652.80	4	21,652.80	4	21,652.80
13.	Peon	1	4,089.60	1	4,089.60	1	4,089.60	1	4,089.30	2	8,179.20	2	8,179.20
	Total:	21+2	1,61,276.40	31	2,52,947.40	44	3,84,916.60	62	5,42,007.00	74	6,55,137.00	78	6,93,831.00
	Add 5% towards annual increments etc.		-		-		12,647.37		19,245.83		27,100.35		32,756.85
	GRAND TOTAL		-		2,52,947.40		3,97,563.97		5,61,252.83		6,82,237.35		7,26,587.85
	Less for present strength (-)				1,69,340.22		1,77,807.33		1,86,697.58		1,96,032.45		2,05,834.07
	ADDITIONAL EXPENDITURE:		-		83,607.18		2,19,756.74		3,74,555.25		4,86,204.90		5,20,753.78

ANNEXURE - II

CHEMICAL AND APPARATUS

Sr. No.	Description	1977-78		1978-79		1979-80		1980-81		1981-82	
		Quantity	Value (Rs.)	Quantity	Value (Rs.)	Quantity	Value (Rs.)	Quantity	Value (Rs.)	Quantity	Value (Rs.)
(A)	Reprography										
	1) Microfilms Rs.100/Roll	20 rolls	2,000	40 rolls	4,000	60 rolls	6,000	80 rolls	8,000	100 rolls	10,000
	2) Document Paper Rs.90/ per packet of 100 sheets each (22 x 33 cms)	100 pkts.	9,000	150 pkts.	13,500	200 pkts	18,000	250 pkts.	22,500	300 pkts.	27,000
	3) Paper for electrostatic machine	-	3,000	-	4,000	-	5,000	-	6,000	-	7,000
	4) Photochemicals	-	2,000	-	2,500	-	3,000	-	3,500	-	4,000
		-	16,000	-	24,000	-	32,000	-	40,000	-	48,000
(B)	Printing (Multiple Copying)										
	1) Lithofilm	-	-	-	10,000	-	15,000	-	20,000	-	25,000
	2) Metal Plates	-	-	-	5,000	-	7,500	-	10,000	-	12,500
	3) Inks, Chemicals etc.	-	-	-	5,000	-	7,500	-	10,000	-	12,500
	4) Photographic Chemicals	-	-	-	2,000	-	3,000	-	4,000	-	5,000
	5) Paper	-	-	-	4,000	-	6,000	-	8,000	-	10,000
		-	-	-	26,000	-	39,000	-	52,000	-	65,000
(C)	Punchards & Flexotapes	-	-	-	-	-	3,000	-	4,000	-	5,000
(D)	Magnetic tapes	-	-	-	-	-	4,000	-	6,000	-	8,000
(E)	Other Stationary items	-	1,500	-	2,000	-	3,000	-	4,000	-	5,000
	TOTAL: (A+B+C+D+E)	-	17,500	-	52,000	-	81,000 (4,000)	-	1,06,000 (6,000)	-	1,31,000 (8,000)

ANNEXURE - III

BOOKS AND PERIODICALS: ADDITIONAL EXPENDITURE

Sr. No.	Description	1977-78		1978-79		1979-80		1980-81		1981-82	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1.	Books, monographs Rs. 100/- each	500	50,000	1000	1,00,000	1500	1,50,000	2000	2,00,000	2500	2,50,000
2.	Periodicals Rs. 400/- title	110	44,000	220	88,000	330	1,32,000	440	1,76,000	540	2,16,000
3.	*Patents & Standards Rs. 7.50 Patent	10000 (4000)	45,000	20000 (5000)	1,12,500	30000 (6000)	1,80,000	50000 (5000)	3,22,500	60000 (8000)	3,90,000
	TOTAL:	-	1,39,000	-	3,00,500	-	4,62,000	-	6,98,500	-	8,56,000

* N.C.L. Library is an "Inspection Centre" for Indian Patents and receives one copy of all Indian Patents free. The estimated number of Indian Patents are given in brackets.

ANNEXURE - IV

EQUIPMENT & FURNITURE

Sr. No.	Description	1977-78		1978-79		1979-80		1980-81		1981-82	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
(A)	Reprography										
1.	Film Processing Unit	1	15,000	-	-	-	-	-	-	-	-
2.	Enlarger	-	-	-	-	1	10,000	-	-	-	-
3.	Film Positive Printer	-	-	1	10,000	-	-	-	-	-	-
4.	Printing Box	-	-	1	2,000	-	-	-	-	-	-
5.	Electrofax Copier	-	-	-	-	1	15,000	-	-	-	-
6.	Scanner	-	-	1	15,000	-	-	-	-	-	-
7.	Xerox (Foreign made)	-	-	1	1,00,000	-	-	-	-	-	-
8.	Off-set printing	-	-	-	-	1	1.00,000	-	-	-	-
	TOTAL:	-	15,000	-	1,17,000	-	1,25,000	-	-	-	-
(B)	Library										
1.	Microfiche	-	-	-	-	1	10,000	-	-	-	-
2.	Linedex	-	-	1	2,500	-	-	-	-	-	-
	TOTAL:	-	-	-	2,500	-	10,000	-	-	-	-
(C)	Data Processing										
1.	Card Punch (2)	-	-	-	-	1	35,000	-	-	-	35,000
2.	Verifier Card (2)	-	-	-	-	1	20,000	-	-	-	20,000
3.	High Speed-sorter	-	-	-	-	-	-	1	80,000	-	-
4.	Collator	-	-	-	-	-	-	1	45,000	-	-
5.	Punched Card/Reproducer	-	-	-	-	1	40,000	-	-	-	-
6.	Calculator (Electronic)	-	-	-	-	-	-	1	40,000	-	-
7.	Tabulator	-	-	-	-	1	40,000	-	-	-	-
	TOTAL:	-	-	-	-	-	1,35,000	-	1,65,000	-	55,000
(D)	Office										
1.	Typewriters (4)	1	1,500	1	1,500	1	1,500	1	1,500	-	-
2.	Electrical Typewriter (2)	-	-	1	10,000	1	10,000	-	-	-	-
	TOTAL:	-	1,500	-	11,500	-	11,500	-	1,500	-	-
(E)	Furniture	-	-	-	-	-	1,00,000	-	75,750	-	-
	TOTAL: A+B+C+D+E	-	16,500	-	1,29,000 *(1,00,000)	-	3,81,500	-	2,42,250	-	55.000

* Foreign exchange component.

ANNEXURE - V

BUILDING AND OTHER ITEMS

Sr. No.	Description	1977-78		1978-79		1979-80		1980-81		1981-82	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1.	Building	-	-	-	10,00,000	-	23,50,000	-	-	-	-
2.	Others										
	(a) C.A. Condensates on magnetic tapes	-	-	-	-	1 copy	80,000	1 copy	1,30,000	1 copy	1,30,000
	TOTAL:	-	-	-	-	-	*80,000	-	*1,30,000	-	*1,30,000

* Foreign Exchange Component.

ANNEXURE - VI

ORGANISATION CHART

CHIEF ..... (Advisory Committee)

1	2	3	4	5	6
Issue keeping Liaison & Publicity	LIBRARY	Documentation/Information service	Data Bank	Translation	Reprography
i) General Administration ii) Liaison iii) Publicity iv) User's Survey v) Union Catalogue	i) Acquisition ii) Processing iii) Maintenance iv) Lending	i) Reference Service ii) C.A.S. iii) S.D.I. iv) Patent Information service. v) Retrospective bibliography vi) Use of computerised services	i) Data compilation & Services ii) Ongoing researches	Translation Services	i) Xerox copying ii) Microfilming iii) Photocopying iv) Duplicating

ON CHANGE OF TITLES OF PERIODICALS, PT.5

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In this fifth instalment of the study, 43 items are considered where titles have been changed mainly for the necessity of introducing better subject denoting terms. Comments, for each of the items, are given.

991 Title Changes of More Specific Nature

Many of the title changes discussed in the earlier parts can be considered, in some ways, to have resulted in simpler titles. Dropping of frequency denoting terms, names of sponsoring agencies, place names, etc. surely result in simpler titles. However, in the present part, we are going to begin with a category of titles where changes appear to have been brought out consciously with the main object of simplifying titles.

992 Simplification of Titles by the Introduction of more Specific Terms

In this Section we are more concerned with changes in the subject denoting terms in titles of periodicals. We have seen earlier that subject denoting terms have often been changed, mainly to indicate broadening or narrowing of scope of periodicals. At times, new subject denoting terms appear indirectly in titles through the inclusion of the new names of sponsoring agencies. The titles in the present Section are quite different from all these. They are listed in Table 50.

Brief comments on changes in the above titles should be in order. In the first item the subject denoting term Insanity has only been replaced by Psychiatry without disturbing the other words in the title. Insanity is a mental disorder. There is no difficulty in getting the correct meaning. However, the subject which deals with mental disorders and their treatment has come to be better known as psychiatry. Hence the necessity for change.

The second item in the Table was originally a spin-off from the Canadian Journal of Research and its Series F carried the specific title Technology. In the next change, when the titles of the different series were given independent status, as discussed in Section 97 earlier, this periodical received the title Canadian Journal of Technology, in conformity with other titles. However, the single subject denoting term Technology was not sufficiently expressive. The subject coverage of this periodical has been actually Chemical Technology. Hence, a revision became necessary. The same subject had, in the meantime, come to be better known as Chemical Engineering. That is how the new terms got into the present title of the periodical.

The change in the third item also follows a similar pattern. Very rapid development in electronic instrumentation, quite naturally, opened up vast possibilities of application in the field of medicine or biomedicine, to be more inclusive. The name that could be thought of immediately for this developing subject was biomedical electronics. As the subject further developed and the medical uses of nuclear energy became a possibility, a more inclusive name of the subject became necessary. This new name is Biomedical Engineering which appears in the new title. Generally, the name of a new subject is first coined by its practioners and only then it appears in the title of its periodical. But, at least in some cases the name of such a subject may first be coined by a periodical title. It would be interesting to make a study of such cases.

The change in the name of the subject covered by the fourth item is of a slightly different nature. Lubrication was the name of the subject and now a new term has been added to it, that is, tribology. The dictionary meaning of the term is scientific study of friction. It is well known that need for lubrication arises because of friction. Hence, a better understanding of the phenomenon of friction can ultimately lead to better methods of lubrication. Such extension in scope and perspective has been a recent trend in many disciplines and specialities.

The title Instruments and Automation (the fifth item), which was earlier called Instruments (1928-53), has changed to Instruments and Control

Table 50: Change due to Coinage of new Subject Denoting Terms

	Changed to	Changed from [with date of last change]
1.	American Journal of Psychiatry	American Journal of Insanity, 1844-21
2.	Canadian Journal of Chemical Engineering	Canadian Journal of Technology, 1951-56
3.	IEEE Transactions on Biomedical Engineering	IEEE Transactions on Biomedical Electronics, 1963
4.	Industrial Lubrication and Tribology	Industrial Lubrication, 1967-69
5.	Instruments and Control Systems	Instruments and Automation, 1954-59
6.	Journal of the Atmospheric Sciences	Journal of Meteorology, 1944-61
7.	Journal of Environmental Health	Sanitarian, 1938-62
8.	Occupational Psychology	Human Factor, 1932-37
9.	Work Study	Time and Motion Study, 1952-64

Systems. The specific area of change is the substitution of the word Automation by Control Systems. This is purely a change in terminology without any intrinsic change in the subject. When the subject first developed, after the Second World War, the name Automation gave it a strong public appeal. It was able to draw the attention of many to the tremendous possibilities of the developing subject. But as it happens, while a subject develops and acquires scientific base, it gets increasinglyremoved from common sense. The change from Automation to Control Systems marks this stage of the subject.

The Journal of Meteorology (item 6) changed its title, in 1962, to Journal of the Atmospheric Sciences. In the same way the title Sanitarian (item 7) changed to Journal of Environmental Health, in the following year. A common trend can be seen behind both the changes. Quite a few subjects appear to have taken a fresh look, in recent years, by extending the boundaries and thus bringing the wider perspective of study. That is how Meteorology has come to be known as Atmospheric Science and Sanitation as Environmental Health. The second title has also changed its structure by introducing the conventional character denoting term journal.

The periodical Occupational Psychology had its earlier title as the Human Factor (1932-37), which in turn had come from the Journal of the National Institute of Industrial Psychology (1923-31). Thus the name of the subject covered by the periodical has actually changed from industrial psychology to occupational psychology. The change in the title was necessary to bring in the terms in current use. The second title, that is, the Human Factor was more of an experimental nature. Perhaps, it tried to suggest, as its subject coverage, the human factor in the industrial set-up. But that was more in the nature of description of a subject rather than a specific name of it. It is significant that the title of the periodical has not changed after 1938. The structures of the last two titles have remained the same, that is, they have included only subject denoting terms.

The last item in this group (item 9) has changed in a similar way. The subject that was described initially as time and motion stuty has now come to be designated by the more specific term work study. Again, the structure of the titles remains unchanged.

It may be appropriate to point out that some subjects change the scope and content with appropriate changes in their name also, while others do not show such outward signs of change. In the titles considered above, and also in some other titles considered earlier, we have seen examples of the former kind. Our study is not concerned with examples of the second kind. However, to make the point clear, an example may be cited. The following extract from the report of the Commission of the Survey of Dentistry in the United States (1961) will show how the field has changed. "Twenty-five or thiry years ago, dental practice was limited to relieving pain and treating lesions of the teeth, the gums, and other tissues of the mouth. Today it is concerned with the comprehensive management of oral, facial, and speech defects and with the oral structures and tissues as they relate to the total health of the individual". Thus, the word Dentistry means much more to-day than its connotation 25 or 30 years ago.

993 Changes of Miscellenebus Nature Leading to More Suitable Titles

In this group we are going to consider a large number of periodicals (90 items) which have changed their titles due to various reasons. The titles are listed in Table 51. In this part we are considering only the first thirtyfour items.

It is difficult to find a common pattern of change in the titles listed in Table 51, except that there is a clear trend in many of them to be simple, short and be specific. Some of them have similarities with changes considered so far under various categories. But none of them could be exactly fitted into any one of these categories as they have mixed trends. That is why they are being considered separately here.

In the very first item, the previous title was actually an odd combination of two alternative titles. Use of alternative titles in books and periodicals is an old practice. It is no longer in vogue nowadays. The periodical in its efforts to abolish this old practice has merely combined the two alternative titles without discarding them. As a consequence the title includes two character denoting terms – Annals and Magazine. In the same way there are in it a number of subject denoting terms – firstly, Natural History and then an elaboration of the same by the three terms, Zoology, Botany and Geology with the connecting word including. All these make the new title a clumsy one with scope for improvement. Even then it has been continuing for a long time. But it is a very prestigious periodical with long standing. It cannot change title very easily.

In the second item the change is restricted to the replacement of the subject denoting terms Aerospace Engineering by the more convenient and current term, Aeronautics. This has resulted in a more precise new title. In the third item the word Construction has been dropped altogether to make the title simpler. In fact the word Construction was only an unnecessary elaboration of the main subject denoting terms Civil Engineering.

Change of Bioresearch Titles to Bioresearch Index (item no.4) can hardly be called an improvement. The operating word Index in the new title surely indicates the character of the periodical. But the world Titles was also equally expressive. The use of this term in the earlier title was a clear indication that the periodical was of title announcement type, which is its exact nature, just as the Chemical Titles is a title announcement service. However, the change has shifted the emphasis to the other characteristic of the periodical to indicate that it is an indexing periodical.

The British Journal of Photography Annual (item no.5) has come from its earlier title the British Journal Photographic Annual. This is hardly

Table 51: Changes of Miscelleneous Nature Leading to More Suitable Titles

Sl. No.	Changed to	Changed from [with date of last change]
1	2	3
1	Annals and Magazine of Natural History Including Zoology, Botany and Geology	Annals of Natural History, or Magazine of Zoology, Botany and Geology, 1838-40
2	Astronautics and Aeronautics	Astronautics and Aerospace Engineering, 1963
3	Australian Civil Engineering	Australian Civil Engineering and Construction, 1950/60-67
4	Bioresearch Index	Bioresearch Titles, 1965-66
5	British Journal of Photography Annual	British Journal Photographic Annual, 1962-63
6	Building	Builder, 1842-1966
7	Canadian Journal of Public Health	Canadian Public Health Journal, 1929-42
8	Ceramic Age	Ceramist, 1921-26
9	Chemical Industry Directory and Whos Who	Chemical Age Directory and Whos Who, 1959-62
10	Coin-op Launderette and Unit Cleaner	Drycleaning and Dyeing Journal, 1938-70
11	Commercial Fisheries Review	Fishery Market News, 1939-45

1	2	3
12	Concrete Building and Concrete Products	Concrete for the Builder and Concrete Products, 1926-28
13	Conferences, Meetings, Training Courses in Atomic Energy	Chronological List of Atomic Energy Conferences, Meetings, Training Courses, 1959-61
14	Cotton Gin and Oil Mill Press	Cotton and Cotton Oil Press, 1936-47
15	Current Contents, Life Sciences	Current Contents of Chemical, Pharmaco-Medical and Life Sciences, 1958-66
16	Current Technical Papers, Bell Telephone Laboratories	Index to Current Technical Literature Bell Telephone Laboratories, 1922-61
17	Dental Practitioner and Dental Record	Dental Practitioner, 1950-54
18	EEE = Electronic Equipment Engineering	Electronic Equipment, 1953-58
19	Electrical Construction and Maintenance	Electrical Contracting, 1928-47
20	Engineering News Record	Engineering News, 1903-17
21	Farming News and North British Agriculturist	North British Agriculturist and Farming News, 1931-39
22	FID News Bulletin	FID Informations, 1951-62
23	Food Processing and Marketing (London)	Food Processing and Packaging, 1960-64
24	Gleanings in Bee Culture	Novices Gleanings in Bee Culture, 1873
25	Heating and Air Conditioning	Heating and Air Treatment Engineer, 1951-60
26	IEEE Transactions on Communication Technology	IEEE Transactions on Communications Systems, 1963-64
27	IEEE Transactions on Computer	IEEE Transactions on Electronic Computers, 1936-67
28	IG Bulletin. =International Geophysics Bulletin	IGY Bulletin, 1957-62
29	Indian Journal of Animal Sciences	Indian Journal of Veterinary Sciences and Animal Husbandry, 1931-68
30	Indian Journal of Dermatology and Venereology	Indian Journal of Veneral Diseases and Dermatology, 1935-55
31	Indian Medical Journal	All India Hospital Assistants Journal, 1907-09
32	Indian Mining and Engineering Journal	Mineral Markets, 1962-64
33	Inland Printer/American Lithographer	Inland and American Printer and Lithographer, 1958-61
34	Investigation of Atmospheric Pollution – Report on Observations	Report on Observations, Advisory Committee on Atmospheric Pollution, Meteorological Office, Great Britain, 1915/16-25/26

a significant change. There is only minor adjustment of words and grammatical refinement. It is significant that the periodical had its beginning in 1861 and continued for hundred years, title 1961, under the title British Journal Photographic Almanac. The present title brings it closer to the well known periodical, the British Journal of Photography.

Changing the title from Builder to Building (item no. 6) is like shifting the focus from the tiller to the soil he tills or from the artisan to his product. Bothways we can have good titles indicating the subject scope of the periodicals. It is to be noted that the periodical started in 1842 and after more than hundred years, in 1967, decided to change its title for the first time, in the way mentioned. It cannot be said, however, that the style of titling has changed during this period. There are even now many periodicals where the titles are focussed on the tillers or the practitioners so to say, such as, Engineer, Librarian, Agriculturist, Foundryman, Listener, Beekeeper, Dairyman, Photographer, and so on.

Canadian Journal of Public Health (item no. 7) had a very trivial change over its former title. With this change an alternative French title has also been introduced. It is Revue Canadienne d Hygiene Publique. The change is significant in the sense that publishers often think it appropriate to bring in such obviously trivial changes to improve the titles of periodicals. The next item (no. 8) started as New Jersey Ceramist and continued with this title for the first four issues only. From the fifth issue, even when the very first volume was in progress, the title was changed to Ceramist by just dropping the place name. The focus remained on the practitioner, in the new title, as discussed under item no. 6. In the present title, however, the focus has been taken away from the practitioner.

In the ninth item there is a change of one word only. Chemical Age has been changed to Chemical Industry. The word 'Age' appears to have a mixed reception in the titling of periodicals. The publishers of some periodicals introduce this word in their titles with considerable enthusiasm while there are others who are pleased to discard the same word from their titles. Item 8 and 9 clearly show the two opposite trends.

In item no. 10 the previous title was surely a conventional title and intelligible too. However, the publisher has opted to change for a modern but less intelligible title. The introduction of the word 'coin-op' signifies the eagerness to be modern. However, once more we find a tendency to focus on the practitioner rather than the practice in the change of the words from Drycleaning to Cleaner.

In the eleventh item, the subject denoting terms Fishery Market have been changed to Commercial Fisheries. This change is quite suitable. In fact, fishery is now clearly divided into two distinct parts – Commercial fishery and Sports fishery. The change in the present title takes care of this accepted standard terminology. What was intended to be conveyed by the expression Fishery market is more suitably conveyed now by Commercial fisheries. It may be observed that the character denoting term in the old title has also been changed to Review.

In item no. 12, the effective change is in the substitution of the expression 'Concrete for the builder' by the more precise expression 'Concrete building'. In a way, again, it is a preference for the practice over the practitioner. The rest of the title remains untouched.

In the next title (item no. 13), only the character denoting terms have been dropped without altering the rest of the old title substantially. The expression 'Chronological list' surely denoted more precisely the particular character of the periodical, but in the context of the other words in the title it appeared to be superfluous. Hence, the change has been in the right direction and the dropping of the unnecessary words has also resulted in a shorter title.

The title of item no. 14 has gone through a number of trivial but interesting changes. So far as the subject of the periodical is concerned, the periodical has been trying to focus two concepts in its title, namely, ginning and milling. In fact, the periodical started, in 1900, with the title Ginner and Miller. This appears to be an attractive title and expressive too. But the publishers thought otherwise. In 1904, in the middle of the fourth volume, the title was changed to Cotton and Cotton-oil News and the Ginner and Miller. This was an unnecessarily long and compound nature of title. Even then the periodical continued with it for nearly 32 years till 1935. In the next change, in 1936, considerable pruning was done which resulted in a shorter title, as Cotton and Cotton-oil press. However, this continued till 1947 only to be replaced by the present title. In the present title, the desire to highlight the old concepts of ginning and milling is explicit. That is how the two words Gin and Mill have reappeared.

Item nos. 15 and 16 are both indexing periodicals. In the first title there were too many subject denoting terms, namely – Chemical, Pharmaco-Medical and Life Sciences. All these have now been replaced by Life Sciences. This is in tune with a similar change in another series of the Current Contents, where a long chain of subject denoting terms has been replaced by the more precise expression Physical Sciences.

The change in the title of item no. 17 shows an opposite trend in the sense that it has chosen a considerably longer title. The old title, that is Dental Practioner, has remained in fact, but with it has been added another title, that is, Dental Record. The expression Record has traditionally found favour with titles of medical periodicals. The present periodical has also been attracted by this word in the same measure.

Item no. 18 has shown a similar tendency in the sense that the original title has been expanded. Thus, from simple Electronic Equipment, it has been expanded. Thus, from simple Electronic Equipment, it has now become Electronic Equipment Engineering. Apart from this change, another innovation has been introduced in the title. The whole title has become a sub-title. The main title is, in effect, the abbreviated form of it, namely, EEE (i.e., triple E). This has surely an added attraction in this age of abbreviations.

Our next item (no. 19) has been experimenting with a number of title changes, since its inception in 1901. The first title, that is, National Electrical Contractor is so different from the present title, which is Electrical Construction and Maintenance. In between, the periodical had experimented with titles like Electrical Contractor-Dealer, National Electragist, Electragist, and Electrical Contracting, for various durations. It would be observed that the changes have been quite substantial in almost all cases. However, apart from the subject denoting term Electrical or its variations, one aspect has been tried to be highlighted, i.e., the work of the contractor. In the present title this aspect has been saught to be expressed by the terms construction and maintenance. Of all the titles that the periodical has experimented with, the present title has continued for the longest. Hence, it can be said to have been the most successful title.

The change in item no. 20 has certain similarities with both item numbers 17 and 18. Here also the nature of title change is by the expansion of the previous title. The previous title Engineering News has been expanded to Engineering News Record, as has been done in item no. 18. The new word added is Record, as has been done in item no. 17, although the present periodical is not a medical periodical. One may wonder whether two character denoting terms, News and Record, are really necessary. It may be pointed out that the periodical has a long history of change of titles since 1874. The first title was Engineer and Surveyor, which was for just one issue only. The subsequent titles were – Engineer, Architect and Surveyor; Engineering News and American Contract Journal; Engineering News and American Railway Journal; Engineering News, and then the present title. It may be noticed that the character denoting term News has come down to the present title through some of the earlier titles. The other character denoting term, that is, Record has been added in the present title for the first time, in 1918. Since then both the terms are co-existing.

The title of item no. 21 has been changed by just reordering the same set of words. There is no change in the words of the two titles. It may, however, be mentioned that the periodical started in 1843 with the title Ayrshire Agriculturist. Very soon the geographical affiliation Ayrshire, was changed to North British. Subsequently, subject and character denoting terms Farming News were added. In the last change, the title cannot be said to have improved in any way.

The title change in item no. 22, which is our field, is again of very little consequence. The character denoting term Informations has been changed to News Bulletin. Both the terms mean, more or less, the same type of periodical. However, the latter expression is more traditional and explicit.

In the change from Food Processing and Packaging to Food Processing and Marketing (London) (item no. 23), an impression is created that the periodical has enlarged its scope, as Marketing means much more things than Packaging. However, the scope remains the same. The same periodical, in fact, had earlier runs with two different titles almost with the same scope. These titles were Food Technology (1931-32) and simply Food (1932-60). In the last change the significant aspect is the replacement of the subject denoting word Packaging by Marketing, which surely is a more suitable expression in the context of its scope. It may be observed that in the new title the place name has also been added in parenthesis.

In the next item (no. 24), the new title has been brought about by just dropping the initial word of the previous title, that is, Novices. Perhaps, the word was initially included in the title to indicate that the periodical was of a popular nature. But, it must be granted that this was a very crude and clumsy way to do so. We can hardly think of any other periodical title where this word has been used. The inappropriateness of the word seems to have been realised very quickly as only for the first year (1873) the word Novices was included in the title. It is remarkable that with this early change, the periodical has continued under the same title for more than a century now, since 1874.

In item no. 25, the present title is quite simple and elegant. There are a number of periodicals on the same subject combinations. However, the wordings in the present title have evolved through stages. Air-conditioning was expressed in the former title by Air Treatment Engineer. In fact the periodical started in 1938 as the Air Treatment Engineer. Perhaps, the expression Air Conditioning, with which we are so familiar now, came into vogue much later.

Title changes in the next two items (nos. 26 and 27) are of the same nature. Current expressions have been introduced in the present titles replacing or deleting obsolete expressions. In the first title the expression Communications Systems have been replaced by Communication Technology. In the second case, the expression Electronic Computers has been changed to Computers. Surely, the term Electronic has become redundant in the context.

The obsolescence of titles of periodicals with the passage of time is again quite prominent in item no. 28. The periodical started as the IGY Bulletin in 1957. It may be recalled that the year 1957 and part of 1958 was observed as the International Geophysical Year (IGY) and hence this name. Even when the year came to a close the periodical continued with the same title. This was surely an anachronistic situation. The position was corrected only in 1963 by deleting mainly the word Year from the title, that is, IGY Bulletin, became IG Bulletin. The abbreviation IGY was known to everybody, but the same is not true for IG. Hence, the new title has been given an attachment of a parallel title explaining the abbreviations in the main title.

It cannot be said for certain whether the expression Animal Sciences exactly stands for the subjects Veterinary Science and Animal Husbandry. But this is exactly what has been sought to be conveyed by the new title of item no. 29. One thing is certain that the earlier title was having too many words to denote its subject coverage. A simplification of the title was quite logical. But the search for a simpler subject denoting term appears to have been a long-drawn affair. Finally, the doubtful expression Animal Sciences has been accepted.

In item no. 30, the change in the title has been more in the nature of minor adjustments. Firstly, the subject denoting term Veneral Diseases has been replaced by the more exact term, Venereology. Secondly, the sequence of the two subject denoting terms Venereology and Dermatology has been interchanged. The need for this change of sequence was necessary in view of the positions of these two words in the name of the sponsoring association of this periodical. The name of the sponsor is the Indian Association of Dermatologists and Venereologists. The change has brought the new title in line with the name of the sponsor, apart from making it simpler.

The new title of item no. 31 appears to be considerably different from the old one. Even then traces of the old title can be seen in the new one. All India have become Indian and the character denoting term Journal has remained intact. Hence, the significant change is in the replacement of the subject denoting terms Hospital Assistants by Medical. The periodical is the official organ of the All India Medical Licentiates Association. Perhaps, to begin with, the Association hesitated to call its periodical a full-fledged medical journal. This hesitation must have been associated with the status of the medical licentiates themselves. The new title has been continuing since 1910 without the necessity of any further change.

The title Mineral Markets was changed completely to give the periodical its new title the Indian Mining and Engineering Journal (item no. 32). The earlier title did not convey that it was a scientific periodical. It was more like a trade journal. In the new title this position has been sought to be corrected. There are now in the title, words denoting geographical affiliation and also subject and character denoting words in the most conventional style. In the bargain, it can be easily seen, the length of the title has increased.

From both the titles of item no. 33, it appears the periodical had an amalgation at a certain stage. The initial title in 1883 was simple Inland Printer. The first change came in 1959 and the new title was Inland and American Printer and Lithographer. Even this was changed in 1962 to Inland Printer/American Lithographer. Whatever might have been the reasons, this change has hardly improved the title in any way. There is, in fact, no significant change. The sequence of the words in the title has only been changed. It is doubtful whetner the present title will continue for long. The word Inland has hardly any significance in the title. The publisher of the periodical may well consider a new title something like American Printer and Lithographer.

NETWORKS OF SCIENTIFIC PAPERS: A COMPARATIVE ANALYSIS OF CO-CITATION, BIBLIOGRAPHIC COUPLING AND DIRECT CITATION

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Citation analysis studies are used to find pattern of networking among scientific papers. The comparative merits of the three techniques, namely, direct citation, co-citation and bibliographic coupling have been discussed in this paper. A pattern of networking, using the co-citation mode, is presented from a sample of papers published in the Soviet periodical Geliotekhnika. The co-citation is established as the most suitable technique for networking.

1 Introduction

One of the important aspects scientific communication is the way in which scientists interact with their colleagues in the production and dissemination of research results. An obvious method of investigating such mutual influenee between scientists, who are linked in a network, so to say, would be to analyse the references that are appended to scientific papers. The word network here, in fact, connotes both interaction between scientists as well as between the papers they write. This usage, however, corresponds to a particular picture of scientific communication. Each scientist here is envisaged as a node from whom lines of communication run, linking him more or less strongly with other professional scientists, with the number of such lines varying from scientist to scientist.

There are various techniques of networking in citation analysis which have been used to study the pattern of communication among the scientists working in the same area/speciality or a segment within a country and also to understand and study the development of a subject and breakthroughs. Based on citation analysis, clusters can be identified on a regular interval or period. It also becomes possible to relate the clusters obtained in one period to those obtained in the next. Thus, one gets a network of clusters and linkages between various workers in an area/speciality or its segment within a country. In this perspective, the clusters give a snap-spot at one point in time of a dynamic system which is moving in a space defined by an area or a new speciality. A study of succession of snap-spots also gives us an understanding of the process or mechanism of new area/speciality. In the ultimate analysis, this may also lead us to anticipate the future development of new area and the changing picture of communication pattern. The present study is an effort towards testing the various techniques of networking of citation analysis.

Relation between papers which indicate activity may occur in various ways as follows:

(11) Direct Citation
(12) Co-Citation
(13) Bibliographic coupling.

11 Direct Citation

If an author is citing a reference in his scientific paper, there is a strong probability that his own paper is related to it. This concept has been used by a variety of researchers to establish relationships among documents of different types. The main credit for developing this concept goes to Garfield and Solla Price. The latter provided a conceptual framework for understanding the concept of network in the overall context of scientific disciplines. He has in fact proposed the following model of network. According to him [1], each paper carries on an average a dozen citations back to the previous literature. His analysis shows that there exist two separate nodes of citation. The first, accounting for almost half of all the references back, may be called archival, almost completely independent of the age of older papers being cited, and without structure. The second type of citation may be called "research front". New papers use the other half of their references to connect back to the relatively small number of highly inter-connected recent papers. In a particular field, each research paper is connected to all its neighbours by many lines of citation. A convenient image of pattern is to be found in knitting. Each stitch is strongly attached to the previous row and its neighbours. To extend this analogy, sometimes a stitch is dropped and the knitted strip then separates into different rows, each of them now forms a new sub-field described from the first one.

12 Bibliographic Coupling

It is postulated that any two scientific papers bear a meaningful relation to each other (they are coupled) either by virtue of their joint decent from a third one, i.e. two papers are said to be coupled if they both cite the same reference (or a test paper) or a group of papers may be formed when each paper in the group has at least one reference in common to every member of the group. The strength of coupling is determined by the number of citations they have in common. This idea was first suggested by R.N. Fano [2], who indicated the possibility of grouping scientific papers on the basis of use rather than content, but the whole credit goes to M.M. Kessler [3], who elaborated, tested and gave the name to this concept for the first time in 1958. It is observed that this concept of relationship has certain drawbacks and does not seem to be a valid unit of measurement because if two papers are citing a third paper, they may or may not be citing an identical piece of information of third paper being cited [5]. So it is merely an indication of the existence of the probability or relationship between the documents.

13 Co-Citation

This concept was for the first time suggested independently by Dr. Henry Small [6] and Marshakova [7] almost simultaneously in 1973 and later on developed by Small in collaboration with Griffith [8, 9] and others. They have in fact identified clusters in various subject fields by a computer program developed at ISI. In fact, co-citation is based on the philosophy that if two citations are cited together in the later literature, they have a relationship among them. The more the frequency of occurrence together, the stronger is the relationship between the two. To be strongly co-cited, a large number of authors must cite the two earlier works. So one can say that it is a measurement of the degree of the relationship between papers as observed by practising scientists or specialists. Further, because of its dependence on the practising scientists, these co-citation patterns may fluctuate as the interests and intellectual patterns of the field change with time. It is also very much similar to the fluctuations of vocabulary occurrences, with the evolution of subject fields. Henry Small maintains that a co-citation which links cited documents is also very much analogous to word associations. If frequently cited documents can be taken to represent the key concepts of a discipline, the patterns of co-citation can be used to illustrate in detail the relationship existing between these concepts.

14 Similarities & Differences between Direct Citation, Bibliographic Coupling and Co-citation.

In the case of direct citation, there is a linkage between the source and cited item, while in bibliographic coupling, linkage is restricted to the source documents. Unlike direct citation and bibliographic coupling, co-citation links cited documents. Looking at their individual patterns, co-citation patterns are found to differ significantly from bibliographic coupling patterns, but agree generally with patterns of direct citation. While bibliographic coupling is a fixed and permanent relationship between papers, because it depends upon references contained in coupled documents, the co-citation pattern is dynamic and may fluctuate as the interests and intellectual patterns of the field change. Unlike bibliographic coupling, co-citation patterns can be readily determined from a printed look like the Science Citation Index. Looking at the bibliographic coupling and co-citation together, co-citation is found to emerge as a mirror image of bibliographic coupling.

2 Method

21 Data Base

The source of data for the present study was the papers cited in the periodical "Geliotekhnika" during the period 1965 to 1975. Out of these, only those citations are analyzed which belong to USSR. The sample has been selected from this periodical under the assumption that it represents a predominant vehicle of communication of research in USSR. The data base consists of 975 articles, which, in turn, cited about 4268 citations. So the real data base was 1800 citations. Out of this data base, 442 distinct document pairs were selected on the basis of their having been cited two or more times. Table 2 provides the frequency distribution of those papers which are cited two or more than two times. The range of this frequency varies from 1 to 41, although a majority of the articles were in the frequency range 2 to 8.

22 Extraction of Pairs of Articles Linked by Co-Citation

221 Creation of Files

Using our original data base, bibliographic information for cited and citing documents were extracted and two separate files were created. The first file includes those items which are cited two or more times and it consists of three parts. The first part of the file consists of any arbitrary numbers assigned to items listed in Part-II. Part-II consists of those items which are cited two or more times in our original data base; the items are arranged alphabetically. Part-III lists those source items which are citing the items listed in Part-II, against each item. The second file is called the source file and consists of two parts. Part-I lists those source items which are citing items and are cited two or more than two times in Part-II of the first file. The numbers assigned to these cited documents are presented against each source item in Part-II.

222 Extraction of Pairs

The process of extracting these pairs is manual.

The following are the steps involved:

i) First of all, the first item of the first file is taken. We know that against each item, are listed, those source items which are citing it.

ii) These source items are taken one by one and are matched in Part-I of the second file and the respective rows in Part-II against the matched source items are ticked.

iii) The ticked rows so received are further matched among themselves vertically, and common pairs are extracted and their frequency is noted. These will be co-citation pairs.

iv) So, if we take all the items of Part-II of the first file one by one and follow the above procedure, we can extract all the co-citation pairs and determine their frequency.

3 Results

A total of 467 co-citation pairs were generated by the 386 source papers. These co-citation pairs vary in co-citation frequency from one to eleven. Now by drawing the actual network we can identify various sub-network of papers or authors working in a particular specialization in U.S.S.R. For our convenience, we have discussed below a particular sub-network, which is a part of the total network obtained (not shown in figure).

31 Example

An illustration of this sub-network is shown in Figure-1. Each box in the network represents a cited paper in a speciality of solar energy research in USSR, which can be described as "Distribution of radiant flux in focal plane or region". There have been many theoretical and experimental studies on this question in USSR and other countries. Aparisi was the first person to do work in USSR in this area in 1955 as part of his Ph.D. programme. According to him, the inaccuracies of reflection are on an average statistical in nature; therefore distribution of irradiance of solar energy reflected from each elementary are of a Concentrator is Gaussian. A list of papers of the above sub-network is attached in Table 1. The above network consists of 13 papers, which may or may not represent important or core papers in the speciality in USSR. Table-2 presents a clear picture of how this sub-network is connected with the total network and within itself in terms of number of times each element of the sub-network is cited in the total data base, number of times co-cited and with how many elements within the present sub-network. It is seen that only three elements, namely, nos. 1, 441, 124 of this network have been co-cited with eight or more than eight other elements of this sub-network. This indicates that these three elements have attracted much attention and they have a considerable impact on others in the speciality to which they belong. On analyzing these three elements further, two of them are found to be products of the first original work undertaken by Aparisi.

32 Distinction & Similarity between Direct Citation, Bibliographic Coupling & Co-Citation

Table-3 reveals a complete picture of the possible linkages between various elements of the sub-network. As seen that the total number of elements or nodes in the network is 13; so the number of possible linkages between various elements of the network will be 78*. If we look at the actual coupling linkages, co-citation has provided 38 coupling/linkages, bibliographic coupling 21 and direct citation 25. As far as the strength of the linkages is concerned, it was found to vary from 2 to 11 in the case of co-citation and 1 to 5 in the case of bibliographic coupling.

Out of 78 possible linkages among 13 papers, there are only 12 instances of high-co-citation (four or more times) between various elements of the sub-network. In 9 cases, the strength of bibliographic coupling was found to be zero and in the rest of the cases, it lies between 1 and 5. This suggests that bibliographic coupling is a less reliable indicator of subject similarity than co-citation.

A much better predictor of a strong co-citation pattern between papers is provided by direct citation, that is citing of one paper by another. Out of 12 cases of strong co-citation (four or more), there were 8 instances of direct connections. On the other hand, there is only one case of very high co-citation (order or strength 8) where there is no direct citation. From the above analysis it can be concluded that co-citation is most comprehensive technique in networking and co-

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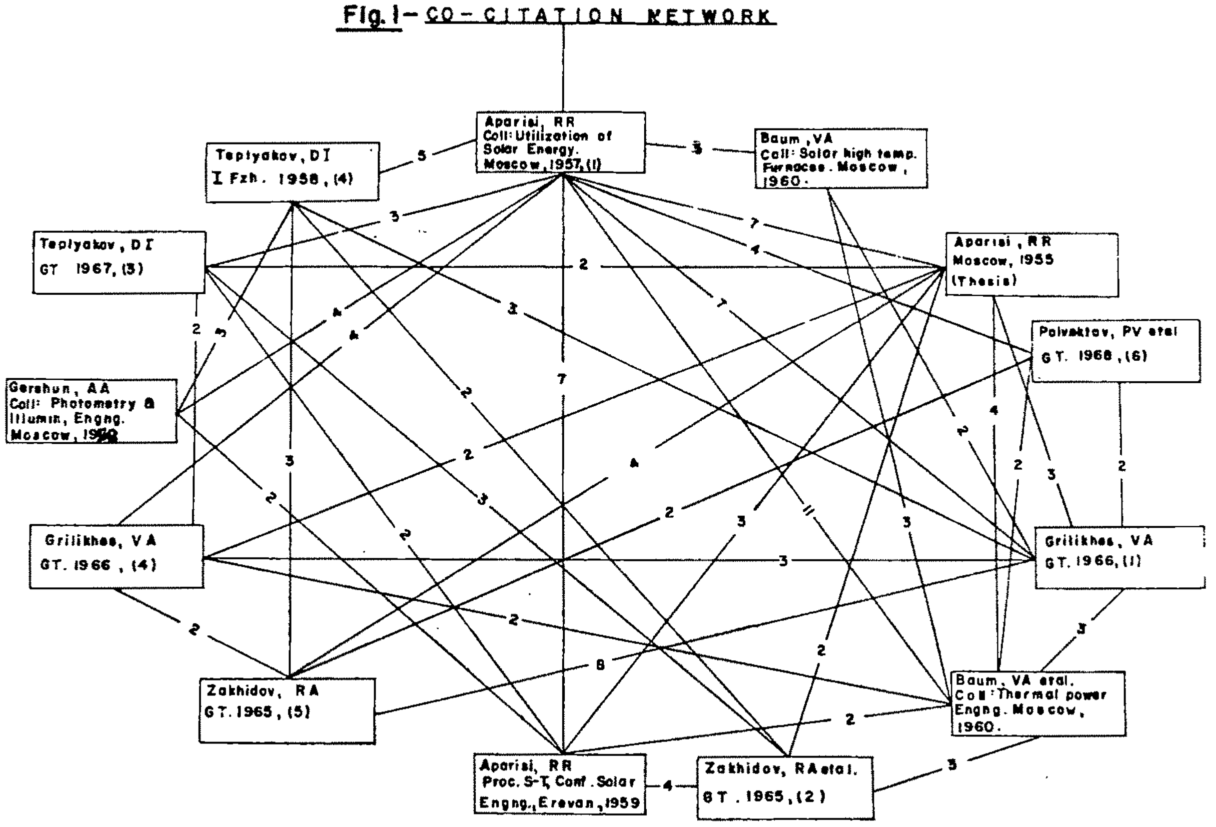
* $\frac{n(n-1)}{2} = \frac{13 \times 12}{2} = 78$

Fig. 1— CO-CITATION NETWORK



citation patterns have shown more similarity and closeness with direct patterns rather with bibliographic coupling patterns.

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TABLE-1: List of Papers or Members of the Network with their Bibliographic Details

1 Aparisi, R R: An experimental device for generating high temperatures. In: Collection on "Utilization of Solar Energy". Moscow: AN SSSR, 1960.

2 Aparisi, R R: Solar furnaces. Proceedings of Sci.-Tech. Conf. on Solar Power Engg. Erevan 1959.

53 Baum, V A: State of art in the area of solar furnaces. In: Collection on "Solar high temperature furnaces". (Translations) Moscow 1960.

64 Baum, V A, Aparisi, R R, Teplyakov, D I: Objectiveestimation of the accuracy of optical systems of solar devices. In: Collection on Thermal Power Engg. Moscow: AN SSSR, 1960, (2).

113 Gershun, A A: The light field. In: Collection on "Photometry & Illuminating Engg. Moscow, 1968.

124 Grilikhes, V A: A method of calculating the solar flux distribution in solar receivers. GT. 1966, 2(1), 3-12.

125 Grilikhes, V A: Algorithm for the statistical solution of the problem of radiant flux distribution in the receivers of solar devices equipped with paraboloidal concentrators. GT. 1966, 2(4), 25-34.

282 Poluektov, P V, Grilikhes, V A: Determining the characteristics of the radiant field in the focal plane of a parabolos solar concentrator. GT. 1968, 4(6), 20-28.

361 Teplyakov, D F: IFZH. 1958, (4).

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439 Zakhidov, R A, Teplyakov, D I: Experimental investigation of the effect of inaccurate orientation of a mirrortype solar power unit on its energy characteristics. GT. 1965, 1(2), 15-23.

440 Zakhidov, R A: Calculation of energy distribution in the radiation field of reflector type solar energy devices. GT. 1965, 1(5), 11-19.

441 Aparisi, R R: Concentration of solar energy in solar energy installations. Moscow: Power Engg. Research Institute, 1955. (Dissertation-Candidate).

TABLE-2: Number of Times each member of the network cited and co-citation in the total network

Ref. No. or Docu. No.	No. of Times Cited	Co-citation		Documents in network
		No. of docu. with co-citation in network	No. of times co-cited in network	
1	41	11	59	13
2	13	6	20	13
53	7	3	10	13
64	14	7	28	13
113	8	3	10	13
124	14	9	32	13
125	7	6	15	13
282	95	4	10	13
361	99	5	16	13
364	5	4	9	13
439	11	5	13	13
440	16	5	19	13
441	14	8	27	13

TABLE-3: Different Types of Relationships between various Members of the Network

Pairs	Type of Relation		
	Direct Citation	Bibliographic Coupling	Co-Citation
1-2	Yes	1	7
1-50	Yes	0	5
1-64	Yes	0	11
1-113	Yes	1	3
1-124	Yes	0	7
1-125	Yes	0	4
1-282	Yes	0	4
1-361	Yes	0	5
1-364	Yes	0	3
1-439	Yes	0	0
1-440	Yes	2	0
1-441	Yes	5	7
2-53	No	0	0
2-64	No	0	2
2-113	Yes	1	2
2-124	No	0	0
2-125	No	0	0
2-282	No	0	0
2-361	No	0	0
2-364	No	0	2
2-440	No	0	0
2-441	Yes	0	3
53-64	Yes	2	3
53-113	No	0	0
53-124	No	0	2
53-125	No	0	0
53-282	No	0	0
53-361	No	0	0

53-364	No	0	0
53-439	No	0	0
53-440	No	0	0
53-441	No	0	0
64-119	No	0	0
64-124	No	0	3
64-125	No	0	2
64-282	No	0	2
64-361	No	0	0
64-364	No	0	0
64-439	No	0	3
64-440	No	0	0
64-441	No	0	4
113-124	No	0	0
113-125	No	0	0
113-282	No	0	0
113-361	Yes	2	3
113-364	Yes	0	0
113-439	No	0	0
113-440	Yes	0	0
113-441	No	0	0
124-125	Yes	2	3
124-282	Yes	1	2
124-361	Yes	4	3
124-364	No	4	0
124-439	No	0	0
124-440	No	4	8
124-441	No	0	0
125-28	No	2	0
125-361	No	0	0
125-364	No	1	2
125-439	Yes	1	0
125-440	No	1	2
125-441	No	0	2
282-361	No	0	0
282-364	No	2	0
282-439	No	1	0
282-440	Yes	1	2
282-441	No	0	0
361-364	Yes	0	0
361-439	No	0	2
361-440	Yes	3	3
361-441	Yes	0	0
364-439	No	2	2
364-440	Yes	0	0
364-441	No	0	2
439-440	No	1	2
439-441	No	0	0
440-441	No	0	4

SOME ANOMALIES IN THE DEWEY DECIMAL CLASSIFICATION SCHEME

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Introduction

Till edition 18 of Decimal classification scheme the D.C. Editorial Policy Committee while recommending additions, deletions etc. in the existing edition of the D.C. followed an uniform policy which was based on the principle of subject integrity where both the subject content and notation are hierarchical. But the Committee always faced the problem at the time of publication of a new edition of the D.C. of how to reconcile the conflicting requirements of the principle of continuity and integrity of numbers and of keeping pace with ever growing knowledge. However, in every new edition the former ideas have prevailed over the latter and as a result with the growth of the D.C. scheme during the last century the libraries which have followed this scheme did not have to face any considerable problem of reclassification of a significant portion of their holdings. This is perhaps one of the reasons for the extensive adaptation of this classification scheme in U.S.A., U.K. and other countries, although since the 1950s the D.C. Editorial Policy Committee has realized the need of the latter principle i.e. revision of D.C. following a principle of keeping pace with knowledge.

After careful study of the current issues of the volume 3 of the "Dewey Decimal Classification Additions, Notes and Decisions" published by the Forest Press Division and Lake Placid Education Foundation, it appears that the D.C. Editorial Policy Committee is going to bring out some major changes in the 19th edition of D.C. which will have considerable impact on and practical consequences to libraries that follow the D.C. Scheme to classify their holdings. These changes will alter the standing century old practices and affect classification of many thousands of volumes.

Some of the major changes recommended by the D.C. Editorial Policy Committee for insertion in the 19th edition of the D.C. scheme appear to be anomalous and discussed in detail in this paper.

I MAJOR CHANGES IN THE APPLICATION OF 900 AND AREA NOTATIONS FOR BRITISH ISLES, UNITED KINGDOM AND GREAT BRITAIN

In the 18th edition of the D.C. the concepts 'British Isles', 'England', 'United Kingdom' and 'Great Britain' are located under Area notation - 42 and that of 'Scotland' and 'Ireland' are under Area notation - 41. However, it is of interest to note that for the Area notations - 41 and - 42 and also for their subdivisions, the D.C. Editorial Policy Committee has recommended an extensive revision. It has been recommended by the Committee in 1975 and later endorsed by the Forest Press to relocate the concepts of 'British Isles', 'United Kingdom' and 'Great Britain' from Area notation - 42 to Area notation - 41 and to shift "England and Wales" from - 41 to - 42 in the forthcoming 19th edition of D.C. scheme. Consequently it is now necessary to classify 'History of Great Britain and United Kingdom' under 941, while that of England and Wales' would remain in 942. The general summaries of the revised - 411 to - 419 and - 421 to - 429 have been enumerated by the Lake Placid Education Foundation in their publications D.C. & 3:7 and D.C. & 3:6, 1975 respectively. However, before introducing this major change in the main class number and Area notation opinions of the reputed librarians of England and those of British National Bibliography (BNB) and Library of Congress (L.C.) were sought by the Committee and all of them, excepting a few British Librarians, have agreed to this proposal. It may be mentioned in this connection that BNB has already introduced this major change in their 1975 annual volume and the L.C. has also started following these in their own classification scheme with effect from 1975.

II. TOTAL REVISION OF SCHEDULES FOR LIFE SCIENCES

The D.C. Editorial Policy Committee has recommended publication of a Phoenix schedule (involving 80 to 100% change in original class number) for the entire life sciences schedules (560-590). From D.D.C. V.1 p.60, it may be seen that a Phoenix schedule is "A completely new development of the schedule for a specific discipline. Except by chance, only the basic number of the discipline remains the same as in previous editions, all other numbers being freely reused". It may be mentioned here that the introduction of similar Phoenix schedules by the D.C. Authority is not a new thing as it is evidenced from the publication of similar schedules for Organic and Inorganic Chemistry, Psychology and Law, and Mathematics in 16th, 17th and 18th edition of D.C. respectively.

Human anatomy (611) and physiology (612) will be classed in 591 along with general animal anatomy and physiology and as such all of 611 and 612 will be relocated at 591. Further, 572-576 will stand for concepts of biological structures and processes in general, 581 for plant anatomy and physiology and 591 for animal anatomy and physiology. However, in 581 and 591 the same base number will be used as in the existing schedules of 18th edition. Further, the taxonomic portion 582-589 and 592-599 with the exception for mammals 599 will not be extensively revised.

CONCLUSION

From study of the different changes recommended by the D.C. Editorial Policy Committee for incorporation in the forthcoming 19th editions D.C., it becomes apparent that the Committee henceforth may not follow the principles of continuity and integrity of numbers as it did in the past. With the emergence of new concepts, radical changes in earlier concepts and reversal of customary classification order, there may be perhaps no other alternative for the Committee but to shift from their century old principle while revising D.C. according to the new principle of keeping pace with knowledge in order to provide more flexibility to the scheme. But the changes proposed for the entries as indicated in I and II section of this paper do not appear to have been necessitated by such considerations.

In regard to the major changes proposed in the area notation for the British Isles (as discussed in I) one cannot help observing that the opportunity for revision could have been utilized to make the classification more rational by assigning either of the Area notations - 41 or - 42 to (a) Ireland or (b) the Republic of Ireland with the other one assigned to the single political entity Great Britain or United Kingdom and subdivided to cover the different parts of namely, Scotland, England, Wales and in the case of (a), Ulster. It is desirable from the points of view of both rationality and practical convenience that in any system of classification, the component parts of an entity, whether political or geographical, should be classed as subdivision of the notation for the entity. But in the proposed revised scheme, England and Wales, which are component parts of the political entity United Kingdom or British Isles (- 41) are placed under a different notation -42, or taking the main island as a geographical entity, component parts of it namely Scotland and England and Wales respectively are placed under separate notations.

Apart from this, the implementation of a change in the standing century old class number viz. 900s and Area notations for British Isles will lead to a serious consequence causing great hardship to the followers of the D.C.scheme who may have to undertake arduous reclassification job of thousands of volumes which is really unfortunate. The success of a classification scheme generally depends on the unchanging feature of its basic structure of the schedules, notations, connecting symbols, etc. If the Committee, like the Colon Classification scheme, henceforth indulges in frequent major changes as indicated in this paper, the popularity of the scheme may perhaps diminish as it has happened in the case of Colon.

The total revision of the schedules for Life Sciences (560-590) by publication of a Phoenix schedule as discussed in II and shifting of all concepts from the schedules in 611 and 612 to 591. is really unfortunate. The arguments advanced in support of the shifting of all concepts from 611 and 612 to 591 appear unconvincing. The shifting is sought to be justified on the basis that the present trend is to class the anatomy and physiological processes of specific organisms with the processes rather than the individual organisms. But under 611 and 612 as well as 591 classification is already in terms of processes and not in terms of species. The editors and committee have further set a limit to the preparation of this principle, that it will be applied only upto the Kingdom level. Thus processes and structures relating to plants will be classed under 581 and those relating to animals under 591. It should have been logical to extend this criterion to processes and structures relating to man, as distinguished from other species of animals, in other words to treat man as belonging to a separate kingdom. This would have been amply justified by the very large volume of knowledge existing and continuing to grow in the fields human anatomy and physiology as compared to animal anatomy and physiology and also the unique practical interest of such studies relating man. The present recommendations are all the more difficult to comprehend because it appears Veterinary Anatomy will continue to be classed under a separate notation, 636.089 with the appropriate numbers following 61 in 610-619 added and not under 591 like human anatomy and physiology. It is of interest to note that veterinary physiology used to be classed under 591.1 till it was assigned the 636.089.1 and 636.089.2 notations in the 16th edition. Another argument for the proposed shifting of concepts under 611 and 612 to 591 is that anatomy and physiology are pure "sciences" and should not be classed under medicine which is an applied science. The distinction between 'pure' and 'applied' sciences is at best a tenuous one and such classification serves little purpose because ultimately all scientific activity is directed to practical ends, whether immediate and foreseen or remote and unpredictable. In the study of human anatomy and physiology, the motivation has always been their relevance and potential application to medicine. Conversely, even granting the feasibility of the exact demarcation of "pure" and "applied sciences", it can be argued even more convincingly that pharmacodynamics is now a pure science, but it is proposed to continue its classification under 615.7. The editors would have done well to avoid so far-reaching a change, bound as it is to affect extensively the existing classification of the holdings of numerous libraries, particularly medical libraries.

However, it is not correct to expect that the D.C. Schedule, being an enumerative one will provide suitable numbers for growing subject like Life Sciences where newer concepts and areas of knowledge keep emerging all the time. The impact of ideas in the newly developed frontier disciplines like biochemistry, biophysics, molecular biology, bacterial genetics, molecular microbiology, cellular and subcellular biology, molecular and biochemical pharmacology on both scientific knowledge and society is of the greatest significance. Considering the enumerative nature of D.C. and also its inability to construct numbers for new concepts as in other analytico-synthetic schemes, it is suggested that the committee should keep sufficient provision in their newly recommended schedules to accommodate newer ideas and knowledge that will continue to emerge in the Life Sciences, either by keeping gaps in the notation or by any other means in accordance with their policy, so that the committee in their future edition could construct new numbers for concept that have acquired significance in between editions.

It may be further concluded that if this trend of revision and complete relocation of main schedules continues in future also, there is every likelihood that D.C. scheme may lose much of its popularity which at present it is enjoying. This is obvious, as because no library can afford frequently to undertake an extra burden of reclassification job of a significant portion of its holding which have already been classified earlier according to an older edition of the scheme. Reclassification will be necessary as without which books on the same subject will be scattered at different shelves due to change in the main schedule of a subject causing great inconvenience, embarrassment and hardship to the readers and as well as to the librarians specially those of the open access libraries. However, the reactions of the readers and that of the librarians who follow D.C. scheme in their libraries can only be known as and when the forthcoming 19th edition of D.C. scheme comes out with these proposed modifications and changes in the printed form.

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CFTRI DOCUMENTATION SERVICES: A USER SURVEY

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A user survey was conducted to evaluate the three Documentation services of CFTRI, namely, Library Bulletin, Documentation List and Food Technology Abstracts. Results have shown that these publications were being used by the majority of users for current awareness purposes. There was a general preference for abstracts among the users over bare titles. The internal structure, such as, classification, indexing, etc., index terms and informativeness of abstracts were stated to be helpful. Improvements were suggested in external format by way of printing, better binding etc. All the users desired to receive these services on a continual basis and about 45.6% of users outside CFTRI expressed their willingness to pay a subscription charge for these services.

0 INTRODUCTION

0.1 FOSTIS

The proposal to develop the National Information System for Science and Technology (NISSAT) during the fifth five year plan is a significant feature of the Science and Technology Plan prepared by the National Committee for Science and Technology [2]. Food Science and Technology Information Service (FOSTIS) [1] is one of the Sectoral Information Centres included in this proposal. FOSTIS will be built around the infrastructural facilities available in the library of the Central Food Technological Research Institute (CFTRI), Mysore, where the central facility will be situated. The regional facilities of FOSTIS will be located in the seven experiment stations at Bombay, Hyderabad, Ludhiana, Lucknow, Mangalore, Nagpur and Trivandrum.

0.2 Documentation Services

The CFTRI library, now redesignated FOSTIS, has grown with its parent institution (Table 1). Since 1963, when CFTRI adopted the policy of project oriented research, it has been rendering documentation service to the CFTRI and its experiment stations. These services are also being distributed to certain outside organizations including industries and individuals both in India and abroad and are generally well received. It also provides the information cover to the Division of Industrial Development, Research and Consultancy Services of CFTRI in its technology transfer activities. The experience gained by these documentation activities during the last decade has given way to the conclusion that the establishment of FOSTIS is an urgent requirement to cover the information needs of the country's growing food industry, R&D organizations and educational institutions specializing in food science and technology, and governmental agencies concerned with planning, production, testing, standardization, quality control and marketing of foods. A recent survey [5] conducted to assess the information resources, services, and information needs of the country in food science and technology has also confirmed this conclusion.

The current services of FOSTIS are the three monthly current awareness services, namely, Library Bulletin, Documentation List, Food Technology Abstracts and the subject bibliographies prepared in connection with symposia and conferences held periodically at the CFTRI. The details regarding the current awareness services are:

1. Library Bulletin (LB): This is a monthly accession list of publications received in FOSTIS during the preceeding month. Earlier it included a Periodical Title Service' which listed about 200 articles per month selected after scanning over 300 periodicals in subjects other than food technology but of interest to scientists of CFTRI. Since January 1976, this service was merged with the Documentation List, thus leaving the Library Bulletin as entirely an accession list.

2. Documentation List (DL): Earlier, this service was termed "Documentation List for Food Technology" as it included only articles in food technology selected from about 150 periodicals every month. Since January 1976, consequent to the merger of the "Periodical title service" of the Library Bulletin, it covers all subjects that are relevant to the work carried out at CFTRI. It includes 400-500 articles every month selected from over 150 periodicals. In this list, the entries are

TABLE 1

Statement showing the development of CFTRI Library

Sl. No.		1964	1965	1966	1967	1968	1969	1970	1971	1975
1.	Books	6,129	6,530	7,418	7,799	8,273	9,187	9,700	10,316	12,407
2.	Periodicals	468	-	-	-	-	-	646	643	656*
3.	Bound volumes of periodicals	7,417	8,184	8,604	9,368	10,284	10,836	11,616	12,236	14,742
4.	Pamphlets, Reprints etc.	2,580	3,276	4,000	5,600	6,000	6,318	6,584	6,800	7,100
5.	Patents	26,084	31,778	36,941	41,032	46,726	51,001	56,028	60,000	68,200
6.	ISI Specifications	1,679	1,984	2,333	2,837	3,561	4,170	4,758	4,815	6,400
7.	Reference materials	-	-	-	-	-	-	-	532	580
8.	Thesis and Dissertations	-	-	-	-	-	-	-	123	358
9.	Readers	421	464	493	650	700	758	814	850	880

*Subs 388 Exchange 79 Gratis 189

classified according to Colon Classification and an exhaustive subject index prepared according to the Chain procedure is provided. In the case of documents in food technology, the depth version of Colon classification for food technology developed is used [3].

3. Food Technology Abstracts (FTA): This is a monthly service covering about 150 core periodicals in food science and technology and including about 200-250 abstracts per issue listed under 18 subject groupings. Earlier it did not have any subject index and cross references were given instead. However, since January 1976, a subject index has been provided.

The above services are being distributed or circulated to a select group of users totalling 207 comprising 89 scientists within CFTRI and its experiment stations and 118 users outside CFTRI including organizations and individuals both in India and abroad.

1 THE SURVEY

1.1 Need for the Survey

Though the above services are being issued for over a decade, no evaluation has been done to find out whether they have created any impact on the users receiving them. Hence this survey.

The main objective of this survey is to find out if these services have been found useful to the users, and if so, to what extent. Incidentally, it will evaluate the adequacy of choice and coverage of these services and find out the different subject areas of interest to users in order that these services can be shaped to effectively serve all user groups. It will also evaluate the helpfulness of the internal organization of these services like arrangement of entries, subject index, index terms etc., and the external format so that improvements can be effecte whenever necessary. It is also expected that this survey will provide useful information which will help in the reorientation of these services to serve the entire country when FOSTIS is fully established as a national information centre.

1.2 Method

The method adopted for the survey is the questionnaire method. Out of a total of 207 individuals and organizations using one or more of these services, 174 (84%) were selected for the survey. The basis of selection being that the user must have been using FOSTIS services continuously for at least 2 years. Overseas users were omitted as the survey is meant for India only.

The questionnaire sent to different users is given in Appendix 1.

1.3 Filled-in Questionnaire

A total of 116 questionnaires (or 56%) were duly filled and returned. Within CFTRI the response was about 78.6% (70 out of 89) and outside

TABLE 2

	CFTRI			Outside CFTRI		
	Regularly	Occasionally	Seldom	Regularly	Occasionally	Seldom
Library Bulletin	43	22	3	23	7	5
Documentation List	48	18	3	22	10	4
Food Technology Abstracts	65	4	-	37	5	1

TABLE 3

	CFTRI			Outside CFTRI		
	Useful	Not useful	No comment	Useful	Not useful	No comment
Library Bulletin	65	-	3	33	2	-
Documentation List	57	5	7	35	1	-
Food Technology Abstracts	66	-	3	43	-	2

CFTRI it was about 54.1% (46 out of 85). Distribution of user groups among the questionnaires received are:

University teachers	16
Business executives	10
Research scientists	83
Govt. administrators	5
Libraries and information centres	2
	116

The above is considered a satisfactory sample for purposes of evaluation as it comprises over 60% of the users asked to fill-in the questionnaire and is represented by almost all categories of users. In a similar survey even a smaller sample (29%) was considered to represent a fair cross section of the users [4].

The succeeding sections give the results of analysis of the returned questionnaires.

2 RECEIPT OF DOCUMENTATION PUBLICATIONS

2.1 Within CFTRI, LB, DL, FTA were received by or circulated to 68, 69 and 69 users respectively. Outside CFTRI 35, 36 and 45 users received or had access to them respectively. A good majority of them used these publications for current awareness purposes (Table 2).

It can be seen from the above table that all these publications are well used and the most used among them is the Food Technology Abstracts followed by the Documentation List.

2.2 Usefulness

2.2.1 Users' opinion regarding the usefulness of publications are given in Table 3.

It is evident from the above table that the users find the Food Technology Abstracts most useful. This corresponds significantly with the findings of the earlier survey [5], and indicates a general preference to abstracts instead of bare titles, evidently, because of their information content. Usefulness of a bare documentation list which is cheaper to produce than the list with abstracts is dependent upon the user having access to a library where he can refer to the articles or being able to obtain reprints or photocopies. It is also pointed out that DL and FTA may be used for retrospective searches and in this respect DL is more useful as it has better coverage. The titles included in DL have been stored in card form and at present about 12,000 cards are available for retrospective searches.

All the users in CFTRI regularly used the library for reference purposes. But, in the case of outside users, 22 used the library regularly, 13 occassionally and 6 seldom. This is mainly due to the fact that many outside users had no library facilities at their places of work and had to rely on outside libraries. Only 1 among the outsiders regularly made requests for photocopies, 9 making occasional requests.

Considering all the above limitations, the use of the Documentation List is no insignificant. It could be a more useful tool if more users become

TABLE 4

	DL			FTA		
	Adequate	Moderately adequate	Inadequate	Adequate	Moderately adequate	Inadequate
Users outside CFTRI	40	22	7	46	21	2
CFTRI users	22	14	-	31	14	-

aware and avail of the existing photocopying facilities. FOSTIS has at present a Xerox machine and an electronic scanner and a microfilming unit is being secured in the near future. In order to make the users become aware of these facilities, information about them is given in each issue of the above publications.

2.2.2 Choice and Coverage of DL and FTA

Majority of users have found the choice and coverage of documents in these publications adequte (53.4% in the case of DL and 66.3% in the case of FTA) or moderately adequate (31% in the case of DL and 30% in the case of FTA).

It has to be pointed out in this context that these publications are local documentation lists and as such have to be selective. Being current awareness services these publications have necessarily to be produced with speed in order that time lag is reduced to a minimum. Moreover, these publications are primarily intended for Scientists of CFTRI and its Experiment Stations to provide literature cover for their work on the projects. As FOSTIS receives several international abstracting services such as FSTA, Chemical abstracts, Biological abstracts etc., CFTRI Scientists can always fulfil their additional requirements by referring to these services. However, in view of the fact that FOSTIS has to serve the country as a whole, in the field of food science and technology, a shift in the policy to take into account the nationwide requirement will become necessary. The choice and coverage of these publications will be expanded keeping in view the subject areas of interest to users and also additional services will be introduced to suit the needs of various category of users in course of time.

2.2.3 Informativeness of Abstracts in FTA

About 93.4% (108 out of 116) of the users have expressed the opinion that the abstracts included in FTA are quite informative. As the Scientists of CFTRI Experiment Stations lacked adequate library services, every effort was made to see that the abstracts in FTA included all information significant to the paper so that they could be relied upon without reference to the original papers as far as possible. This has been made possible as abstracting is being done by information scientists who are well acquainted with the R&D projects in progress at the Institute. Obviously, this feature has been helpful to users and possibly this may be the reason as to why FTA is preferred most.

3 USE OF INTERNATIONAL SERVICES

Majority of users (about 80%) regularly used international abstracting and indexing services like FSTA, Chemical abstracts, Biological abstracts, etc. The fact that inspite of access to these services the users have found DL and FTA useful bears testimony to the adequacy and convenience-to-use features of these services. Majority of the users (about 70%) have also found the time lag in these services acceptable as compared to the international services.

4 INTERNATIONAL ORGANIZATION IN DL & FTA

The findings of some earlier surveys have revealed a reluctance of users to use indexing and abstracting services but there are also surveys reported findings of which contradict the above [6]. However, one significant point that has come out is that those who are reluctant to use the bibliographic tools find them inconvenient to use. Convenience factors in indexing and abstracting services are the internal organization (i.e. arrangement of entries), indexing, cross references etc, and also the factors that contribute to a good get up, namely, readability of the reproduced matter, binding etc.

Users opinion regarding the helpfulness of internal organization of documents in DL and FTA are given in Table 5. About 87% of the users who replied the questionnaires have found the classification of documents in these publications satisfactory. Cross references in FTA were acceptable to about 101 users (87%) of the users out of which 35 users (33.4%) preferred subject indexes. In this connection, it is recalled that the cross references in FTA were discontinued from January 1976 and subject index introduced instead, because subject indexing is a more standardized procedure and adopted by most of the national and international indexing and abstracting services. Index terms being used in these indexes were found helpful by 89 users (76.7%). Many users (98 or 84.8%) were preserving these documentation publications for retrospective use and 86 of them (74.5%) preferred to have a cumulative index at the end of each volume.

TABLE 5

Internal Organization of Documentation Publications (only Documentation List and Food Technology Abstracts)

	Classified arrangement in DL and section headings in FTA		Cross references in FTA		Subject Index				Index terms		Cumulative Index	
					DL		FTA					
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Users within CFTRI	58	-	59	5	61	-	62	-	54	6	45	11
Users outside CFTRI	44	6	43	1	40		33	-	35	1	41	1

5 PHYSICAL MAKE UP

The physical get up of the publications which are now being mimeographed was found generally satisfactory. However, several users preferred printing of the publications which would give them better get up and also better binding.

6 CONTINUANCE OF DOCUMENTATION PUBLICATIONS

All users were unanimous in their desire for receiving these publications on a continual basis. This indicates affirmation by users of the usefulness of these publications. Users from outside CFTRI were also put the question as to whether they were prepared to pay a nominal charges towards these publications. About 45.6% (or 21 users) expressed their willingness to pay for these publications.

7 SUMMARY

User survey to evaluate the documentation services of CFTRI viz., Library Bulletin (LB), Documentation List (DL), and Food Technology Abstracts (FTA) was conducted. Questionnaires (174) were distributed to 89 Scientists within CFTRI and 85 users outside CFTRI. Out of a total of 174 questionnaires 116(66%) were duly filled and returned, 70 out of 89 (or 78.6%) were from within CFTRI and 46 out of 85 (or 54.1%) were from users outside CFTRI. Results of the survey have shown that these publications are being used for current awareness purposes by majority of users and a good many of them have found them useful (Table 2 & 3). FTA has been found to be the most useful, which indicates a general preference for abstracts among the users. Though the use of DL was not insignificant, availability of good library and photocopying facilities may increase its usefulness. The internal organization of these publications, like classification, indexing and cross references have by and large been found satisfactory. So also the index terms used in the subject index and the informativeness of abstracts in FTA. While external format or get up of the publications was generally found satisfactory, several users have expressed that improvements could be effected by printing, better binding etc. All users desired to receive these services on a continual basis and about 45.6% of the users from outside CFTRI expressed willingness to pay a subscription charge for these services..

8 ACKNOWLEDGEMENT

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Appendix

USER ASSESSMENT OF CFTRI DOCUMENTATION SERVICES

– A User Study

QUESTIONNAIRE

1. 1	Name of the Organisation/Individual	
1. 2	Address	
1. 3	Kind of Organisation	Research & Development Teaching Government Department Corporation Learned Society Industrial
1. 4	Areas of interest	
2	Do you receive the following Documentation publications?	
	a) Library Bulletin	Yes/No
	b) Documentation List	Yes/No
	c) Food Technology Abstracts	Yes/No
3. 1	Do you see the above publications for current awareness purposes?	
	a) Library Bulletin	Regularly Occasionally Seldom
	b) Documentation List	Regularly Occasionally Seldom
	c) Food Technology Abstracts	Regularly Occassionally Seldom
3. 2	Do you find them useful? Please grade the extent of their usefulness	
	a) Library Bulletin	Very useful Useful Not useful
	b) Documentation List	Very useful Useful Not useful
	c) Food Technology Abstracts	Very useful Useful Not useful
3. 3	Please state whether the choice/coverage of the material included is adequate or otherwise	
	a) Documentation List	Adequate Moderately adequate Inadequate
	b) Food Technology Abstracts	Adequate Moderately adequate Inadequate

4	Do you use regularly the International Abstracting and Indexing services such as Food Science and Technology Abstracts, Chemical Abstracts, Biological Abstracts, Current Contents etc?	Yes/No
	If 'Yes' in comparison to these services, please state whether the time lag in our documentation publications	Acceptable/Not acceptable
5.1	How often do you refer to the articles indexed in our documentation publications in any of the library accessible to you?	Regularly (once a month) Occasionally (once in two to six months) Seldom (once in more than six months)
5.2	Have you ever requested for photo-copies/xerox copies of articles indexed in these services? (for users outside CFTRI only)	Yes/No
	If 'Yes' please state how often	Regularly (once a month) Occasionally (once in two to six months) Seldom (once in more than six months)
6.1	Do you find the classified arrangement of articles in Documentation List and under section headings in Food Technology Abstracts helpful?	Yes/No
	If not, please give your suggestions and also suggest additional sections, if needed, for food technology abstracts	
6.2.1	Is the subject index provided for each issue of Documentation List useful	Yes/No
	If not, please give suggestions	
6.2.2	Are the index terms used in the index in Documentation List helpful for retrieval purpose?	Yes/No
6.2.3	Do you find the cross references provided in Food Technology Abstracts helpful?	Yes/No
6.2.4	Do you preserve these documentation publications for retrospective use	Yes/No
	If yes, do you feel provision of a yearly cumulative subject index will improve retrieval quality	Yes/No
7	Do you find the physical make up (get up) of these publications generally acceptable?	Yes/No
	If not, please give your suggestions	
8.1	Do you wish to receive the above publications on a continual basis	Yes/No
	If 'No' please state reasons	
	If 'Yes' please state if you are prepared to pay a nominal charge towards subscription to these services (for users outside CFTRI only)	Yes/No
9	Any other comment	

SIGNATURE

SURVEY METHODS IN THE EVALUATION OF LIBRARY RESOURCES

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Libraries, particularly research and academic libraries, are becoming many-fold complex and specialised with the rapid growth of research, literature and its users' demand of partial or complete evaluation of the collection from time to time. The paper embodies various methods of survey, its objectives, usefulness for the evaluation of collections, and the results of a survey of Panjab University Library Collection, particularly Physics Literature supported with many suggestions that are needed for its improvement.

1 INTRODUCTION

There is no escape for us from the rapidly changing trends and increasing impact of libraries on our social, scientific and technological advancement. The aim of a research library is to support the aims and objectives of its parent organization and the aim of a parent organization is, usually, to do social, economic, political, scientific or technological research, bring change in the society, produce goods, offer services, develop techniques and meet the potential and pressing needs of the people. Libraries have to be catalysts in the process of continuous development. About a century ago, when research output and its users were small in number, it was quite easy to examine and evaluate the collection of a library in the light of the aims and objectives of its parent organization. Literature explosion by way of vast amount of research output, and tremendous increase in the number of its users have made the libraries today highly complex and complicated. Research libraries in particular, have become highly specialised, difficult to use and naturally, demand rigorous social justification. Literature explosion on the one hand and limited financial budget and crazy race for research on the other hand make it necessary to conduct some survey or examination of the collection so as to measure its adequacy, effectiveness, usefulness and up-to-dateness, etc. from time to time. This is an agreed fact that no library, however resolute, wealthy, or long-established can have every material or document, that any one could want. It is only through survey that collections can be assessed with a view to fulfil maximum needs with the minimum financial resources available for their effective and fullest use.

2 OBJECTIVE OF SURVEY

The objective of any survey of library collection is

i) To examine and evaluate the nature of collection for an implied or specified purpose.

ii) To determine the condition of collection regarding its internal organization and maintenance and its relevancy to the aims and objectives of the parent organization to which the library is attached.

iii) To make a comprehensive or selective study of a specified subject-field or group of several subject-fields with an intention to draw some helpful conclusions.

iv) To estimate the value of a collection in comparison with the collection of some other library of similar nature.

v) To present the results of some examination, evaluation or study in the form of some special document or report.

3 USEFULNESS OF SURVEY

Any survey of a library collection is basically planned to serve:

i) As a replica of the basic resources of a library, a group of subject-fields or any specific subject-field.

ii) As a reference manual for a research scholar or reference librarian on the resources surveyed.

iii) As a helpful tool for the compilation of a union catalogue, for inter-library loan for an outside library, for comparison of basic resources with similar other libraries or with some basic standard subject-lists or authorized lists which are compiled by experts or long-experienced librarians.

iv) As an important selection aid for libraries which are building up their initial collections or a collection on any particular subject-field.

v) As a useful source to determine the relative strengths and weaknesses of collections, users' needs, use-factor (ratio of use to holdings) for specific subject classes in order to measure the intensity of use of all or parts of the collection, performance-index (ratio of material used to material requested) for each subject class.

vi) As a reliable method for the proportional analysis of different subject fields and its possible mismatches with users demands or with basic standard collections, for reviewing of acquisition, retention or weeding out policies, for measuring growth rate of all kinds of literature, for gauging users requirements and their ultimate degree of satisfaction with the nature of collection.

vii) Above all, as a valuable guide for easy understanding and persuade and convince the authorities for necessary help or support. It can also be used to demonstrate to higher authorities the condition of its collection and how well the library is serving its clientele.

4 SURVEY METHODS FOR THE EVALUATION

There are several ways of surveying the collection of a library. Some of them are detailed below:

4.1 Surveying Through Published Lists

Comparing a library collection with published lists, such as, standard book selection lists, selective and specialised subject bibliographies, basic subject lists, publishers' lists of best books, standard catalogue of specialised collection, guides to subject literature, list of comprehensive surveys of larger academic or special libraries, standard guides of basic reference collection, standard directories of periodicals, authorised lists, etc. is one of the methods for the evaluation of library collections. By comparing the library holdings on different subject fields with that of standard check-lists, it is easy to assess the worth of library collection relative to the list used.

4.2 Surveying Through Users' Opinions

Since library readers are the actual users of the collection, so knowing users views through interviews or questionnaires is another way of evaluation of library collection. On the basis of users opinions, it is possible to identify the inconsistencies in a collection, the nature and kinds of their needs, trends in research and their present and future interests.

4.3 Surveying Through Direct Observation

By examining and browsing through the library holdings directly is another way of evaluating the collection. On the basis of this method it is possible to ascertain the size, scope, depth, adequacy, up-to-dateness and significance of collection; clue about duplicate collection, maximum and minimum used documents, and general condition of collection regarding its maintenance, organization etc.

4.4 Surveying Through Widely Accepted Standards

Applying some widely accepted standards or a set of criteria is another way for the evaluation of collections of libraries. These are based on sound judgements, criteria, surveys, evaluations, etc. of some long-experienced, authoritative and acknowledged personality in the concerned field. The collections, particularly that of academic or special libraries have been studied both extensively and intensively in recent years, on the basis of which it is possible to tell how much collection; what additions, how much staff and what other services, etc. are needed for a particular type of library.

4.5 Surveying Through Compilation of Statistics

This is an important and potential method for the evaluation of library collections. By compiling statistics on various aspects, e.g. total collection/year, additions/year, weeding out/year, expenditure/year, comparison of collections with similar other libraries,special materials and their use, enrolment, circulation, inter-library loan requests, comparative subject-balance, up-to-dateness, etc. it is possible to give a good estimate about the relevancy and worth of the collection and draw some helpful conclusions. Besides it, figures are more important, significant and persuasive than mere theoretical statements. Recommendations or suggestions made on the basis of factual survey carry more weight and are more convincing for necessary help and support from the authorities.

The evaluation of a library collection can be done by any of the above mentioned methods, but compiling statistics in conjuction with other methods, seems to be more helpful. Most of the surveys are based on statistical compilations and aided or supported by users' and experts opinions. The facts and figures can support the need of the users, and the users' opinions can help in getting the necessary things done.

The following results were obtained partially through direct observation, compiling statistics and taking users' opinions while surveying the literature in the field of Physics at Panjab University Library, Chandigarh.

1) Total collection - 3,36,270 (3436 in Physics)

2) Average annual addition - 15,784 (100 in Physics)

3) Total membership - 4,541 (210 in Physics)

4) Number of books/user (Approx.) - 74 (17 in Physics)

5) Average circulation/year (Approx.) - 2,50,000 (5000 in Physics)

6) Periodical titles subscribed - 1,604 (83 in Physics)

7) Average weeding out/year - 270

8) Average audio-visual material added/year - 5

9) Average number of books & journals issued to other libraries for inter-library loan - 249

10) Average expenditure/year - Rs. 12,43,333

11) Maximum collection - Modern Physics (about 20% of the total)

12) Order of collection - Physics :

   a) Modern Physics (Maximum)
   b) Electricity & Electronics
   c) Heat
   d) Mechanics
   e) Optics
   f) Mechanics of Fluids
   g) Mechanics of Gases (Minimum)

13) Relative strength as compared to mechanics of gases

   a) Modern Physics (about 15 times greater than the Mechanics of gases).

   b) Electricity & Electronics (7.5 times greater than the Mechanics of gases).

   c) Heat (6.5 times greater than the Mechanics of gases).

   d) Mechanics of Fluid (5.5 times greater than the Mechanics of gases).

   e) Optics (5 times greater than the Mechanics of gases).

14) Up-to-dateness of Physics - Collection

   a) Percentage of books published during the year

      i) 2% during 1972-1974
      ii) 33% during 1961-1971
      iii) 38% during 1940-1960
      iv) 27% before 1940

15) Collection in Physics as prescribed in University Syllabi of B.Sc., M.Sc., Hons. students to fulfil the teaching functions

   a) Adequate

16) Adequacy of books available as per the needs of users

   a) Students - 90%
   b) Scholars - 60%
   c) Teachers - 80%

17) Field of specialization in Physics at P.U., Chandigarh

   a) Nuclear Physics
   b) Plasma Physics
   c) Astro-Physics
   d) Solid State Physics
   e) Electronics

18) Maximum collection in specialised fields of physics

   a) Nuclear Physics

19) Total reference collection in Physics

   a) 100 (Excluding Periodicals)

20) Maximum reference works on Physics

   a) Modern Physics

21) Minimum reference works on Physics

   a) Mechanics of Gases

22) Scarcity of reference works in specialized subject

   a) Astrophysics
   b) Plasma Physics
   c) Space Physics

23) Technical Literature (Report, Specifications, Patents, etc.)

   a) Inadequate

24) Classification, Cataloguing, Subject-Headings

   a) Dewey Decimal Classification
   b) Anglo-American Catalogue Code, 1967
   c) Library of Congress list of subject-heading, and
   d) Sears' list of subject-headings.

25) Subject-wise analysis of periodical titles in Physics

   a) Physics-General (Maximum)
   b) Modern Physics,
   c) Mechanics
   d) Acoustics
   e) Optics
   f) Heat (Minimum)

26) Periodicals in Physics acquired on exchange - basis

   a) Nil

27) Number of periodicals in Physics/User (approx.)

   a) One

28) Scarcity of periodicals in Physics

a) Heat
b) Astrophysics
c) Space - Physics
d) Solid State Physics
e) Plasma Physics

29) Suggestions made: There is a need for

a) Separate storage facilities for rarely or non-used material.

b) Updating of collection.

c) Strengthening of reference collection in specialised topics like Plasma Physics, Solid-State Physics, Astrophysics.

d) Quick photocopying service and internal translation service for foreign journals.

e) Informing the users about the new additions made from time to time through some bulletin.

f) Revising acquisition policy e.g. active participation of teachers, students and scholars in book selection programmes.

g) Thorough scrutiny of already gifted material and its proper processing.

h) Improving the general condition of library catalogue.

i) Weeding out of out-dated technical and other literature.

Thus, on the basis of any of the methods, it is possible to evaluate the main collections, any part of the collection or different kinds of collections in the library. The survey methods thus play a significant role in improving and updating the library collection from time to time. It is thus intended to compute the present situation of the library collection and project the users' needs, services and any other requirements for the future.

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FOCUS ON UNISIST PROGRAMMES

The following items have been selected from the UNISIST Newsletter Vol 5, issues 2 and 3,1977.

WORLD DATA REFERRAL CENTRE

WDRC, a referral centre initially sponsored by Unesco within the UNISIST framework now being established by the Committee on Data for Science and Technology of the International Council of Scientific Unions (CODATA) will seek to give guidance to data users on the availability and sources of the data they need. It is intended to provide a worldwide focus on referral activities, and to improve capabilities to answer scientific and technical questions, especially those involving data.

WDRC's functions and services will include:
a) Collecting information concerning major resources of data and related scientific information on worldwide basis and constructing a file of this material for convenient retrieval;

b) Preparing and disseminating documents to assist local and national services to conduct data referrals;

c) Provide advice to local and national services on problems of data referral;

d) Performing data referrals on request from national and local services and, when necessary, from individual inquirers.

CODATA is now preparing a Master List of referral resources with emphasis on numerical data resources. When this list has been assembled, WDRC will begin actively to communicate with local, regional and national referral organizations throughout the world. This should occur in late 1977.

STUDIES UNDER DEVELOPMENT UNDER THE GENERAL INFORMATION PROGRAMME

Since the establishment of the General Information Programme, the following studies are being prepared under Unesco contract with non-governmental organizations:

1. Guidelines for the Planning and Organization of School Libraries (contract with IFLA). A set of guidelines is being prepared for the planning and organization of school libraries, particularly in developing countries...

2. Comparative Study of National Lending System (contract with IFLA). This study will provide a comparative analysis of the principal existing national lending systems. On the basis of the results of this analysis, one or variant models of interlending systems will be developed for improving the Universal Availability of Publications (UAP) particularly for developing countries.

3. Handbook of International Standards Governing Information Transfer (contract with ISO). This Handbook which will be prepared and published by ISO, will constitute a back-up service for the UNISIST Manual for Information Handling Procedures and shall contain the texts of those ISO standards and Draft Proposals relevant to the information process.

4. In addition to the above and other contracts for reports or studies a contract has been signed with ICSU/CODATA for the design of a curriculum, teaching materials and procedures appropriate to a short (1-2 weeks) training course on techniques used in achieving adequate dissemination of scientific data. The audience of such a course shall be a group of 20-30 specialists active in the publication and dissemination of data, a sizeable portion of these being from developing countries. A first course of this kind is probably to be given in 1978.

ADVISORY COMMITTEE FOR THE GENERAL INFORMATION PROGRAMME

Pursuant to Resolution 5.1 adopted by the General Conference at its nineteenth session (Nairobi, 1976), the Director-General has established an Advisory Committee for the General Information Programme. According to its Statutes, the Committee supersedes the UNISIST Advisory Committee and the International Advisory Committee on Documentation, Libraries and Archives (IACODLA).

18 experts and specialists in the disciplines and professions with which the General Information Programme is concerned have been nominated by the Director-General for two to four year periods.

Prof. A. Neelameghan (DRTC) is a member of this Committee.

INTERNATIONAL SEMINAR FOR MANAGERS OF LIBRARY AND INFORMATION SERVICES

In International Seminar on Administration for Managers of Scientific and Technical Library and Information Services was held from 13 to 26 June 1977 in Ankara, Turkey. It was organized by the Documentation Centre of the Scientific and Technical Research Council of Turkey and Unesco under its General Information Programme.

Thirty-one participants from Austria, Bangladesh, Egypt, Ethiopia, Federal Republic of Germany, Hungary, India, Iran, Iraq, Lybia, Nigeria, Portugal, Sierra Leone, Tanzania, Turkey, United Kingdom, Yugoslavia, attended the seminar...

The programme which covered all important aspects of management dealt with in lectures, group discussions, role playing and an open forum was well received by all participants and succeeded in achieving its objective of shifting their perspectives from librarianship to managerial issues. The informal interactions between the programme directors (Professors Wasserman and Rizzo), the local faculty and participants, as well as among the participants themselves, proved to be very important components of the seminar experience nents of the seminar experience.

EDUCATION AND TRAINING OF USERS OF SCIENTIFIC AND TECHNICAL INFORMATION - A NEW PUBLICATION

In most countries there are a number of libraries and documentation centres, and to various degrees, a certain amount of modern technology for storing and retrieving information. Users have to be trained to utilize these facilities.

In order to help those responsible for organizing courses, seminars and workshops for the training of users, Unesco has now issued a publication called "Education and Training of Users of Scientific and Technical Information: UNISIST Guide for Teachers". It was prepared by Prof. A. Evans, Loughborough University of Technology, U.K. together with Mrs S Keenan and Mr B Rhodes of the same university... This publication may serve as a basis for preparing training programmes both in the form of a basic education course for students at university level and as a training workshop for pracitioners... It is intended to have particular application to circumstances in developing countries...

The publication is obtainable from major booksellers or through national distributors of Unesco publications.

BOOK REVIEWS

Indian library chronology, by P S G Kumar. Delhi, Metropolitan Book Co., 1977. xviii, 692p.
Rs 100 ($ 19.95)
[Reviewed by B Guha]

Most of us are only silent spectators of passing events around us. Events, in which one may have some involvement or interest, are likely to be remembered for some time. Others are easily forgotten and leave no impression on one's mind. Only a few amongst us have the inclination and energy to record the events systematically in the larger interest. Shri P S G Kumar of the Department of Library Science, Nagpur University, is surely one person gifted with this laudable bent of mind who has produced, for the benefit of the profession, this massive chronicle of events of the library world.

The compilation has chronologically listed as many as 3500 items covering events, publications, meetings, celebrations, personalia, services, etc of interest to library workers in India. The chronology begins with an entry on Mohenjo Daro, Harappa and Lothal seals dated the 3rd Millennium B C. Events from that distant point in time upto the end of the 19th century have all been compressed into a mere 79 pages range of the text. This means the bulk of the chronology is devoted to the events of the present century and within that the focus appears to be the events since the third decade or so of the century. The last item is about the International Study Conference on Classification Research, held in Bombay in 1975. The 504 pages text of the chronology is supported by an index of 187 pages with more than 10,000 entries.

In a vast canvas like the one that has been drawn up by the compiler, it is quite easy to miss some important events and is also difficult to decide at times what is to include and what to reject. At times it may be difficult to decide what emphasis is to be given to a particular event. The present compilation brings into focus many of these difficulties.

In the first few pages, the compiler has very rightly listed, under appropriate chronological positions the early printing presses, publications and personalities associated with them. Names of Joan Gonsalves, Ziegenbalg, William Carey, Wilkins are there. But, unfortunately, the name of Panchanana Karmakar is missing. The index makes no mention of Nathaniel Brassey Halhed with whose name is associated the first Bengali grammar. A search in the text revealed (under 1778) that this celebrated name has been put as Ralhed Nathaniel Brassey. The index, however, makes no reference either under Halhed or Ralhed. Coming to the main part of the chronology, much could be said about the coverage and emphasis on events. Since the present reviewer is closely associated with INSDOC, it is quite easy for him to detect a number of omissions about its activities. None of the union catalogues compiled and produced by INSDOC have been mentioned although similar catalogues released by ICSSR have been listed. Similarly, a mention has been made about the erstwhile INSDOC List, but there is no mention of the Bibliography of Scientific Publications in South and South-East Asia. Again, there is no mention of a number seminars organised, lectures arranged or visits of important personalities to this Centre. Appointments and foreign visits of some librarians have been considered to be important events to merit mention in the chronology. But similar events relating to a large number of other librarians have not been mentioned. Perhaps, the source material the compiler has used have infused this bias.

One unfortunate thing about the publication is the innumerable printing errors scattered all over. The compiler has claimed that 'many of the mistakes in the text have been correctly presented in the index. Hence index also compensates the need of an Errata'. The present reviewer feels that this is not exactly so. In fact, new errors have crept into the index. The case of Halhed has been mentioned above. A highly intriguing entry in the index prompted the reviewer to make some search. The entry is 'Bangal/Nat Central Lib in Punjab/ Move for 1951 [17]'. Actually it refers to item 16 and not 17, regarding a paper on the subject. But it has been put under the absurd index heading Bangal. A number of personal names have been wrongly spelled in the index, e.g. Kesvan (for Kesavan), Dickenson (for Dickinson) etc.

However, it has to be accepted that inspite of the blemishes of the above nature, the publication is likely to be a useful reference tool in the absence of any other publication of this nature.

INDIAN NATIONAL SCIENTIFIC DOCUMENTATION CENTRE

The Centre has been established by the Government of India with the help of UNESCO to serve as a vehicle for the procurement, exchange, and dissemination of scientific information required by the Indian scientist engaged in research and development. Its operation has been entrusted to the Council of Scientific and Industrial Research.

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